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March 31st
1982**

EDMONTON

Alberta
ENERGY AND
NATURAL RESOURCES

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ENERGY AND NATURAL
RESOURCES

Office of the Minister

Legislature Building, Edmonton, Alberta, Canada T5K 2B6 403/427-3740

October 20, 1982

To His Honor
Frank Lynch-Staunton
Lieutenant Governor of the
Province of Alberta

Sir:

I have the honor to submit the Annual Report of the Department of Energy and Natural Resources for the fiscal year ended March 31st, 1982.

Respectfully submitted,

A handwritten signature in cursive script that reads "Merv Leitch".

MERV LEITCH
Minister of Energy and Natural Resources



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The Department

RESPONSIBILITIES

The Ministry is responsible for administration and management of Alberta's energy and natural resources: energy, minerals, forests, public lands and fish and wildlife.

These responsibilities include advice to the Minister on policies and programs of energy and renewable resources. The Energy Resources Sector applies sound management practices to ensure the largest and most efficient recovery of a depleting resource and maximum royalty revenues for the province. The Renewable Resources Sector is charged with the efficient development and planned reforestation of Alberta's forests, the management of public lands and the management of the fish and wildlife resources for the continued benefit of the province.

ORGANIZATION

The Department organization is shown in the accompanying organization chart. There were 2 551 authorized permanent positions as of March 31, 1982. The total 1981/82 expenditure authority was \$249 million.

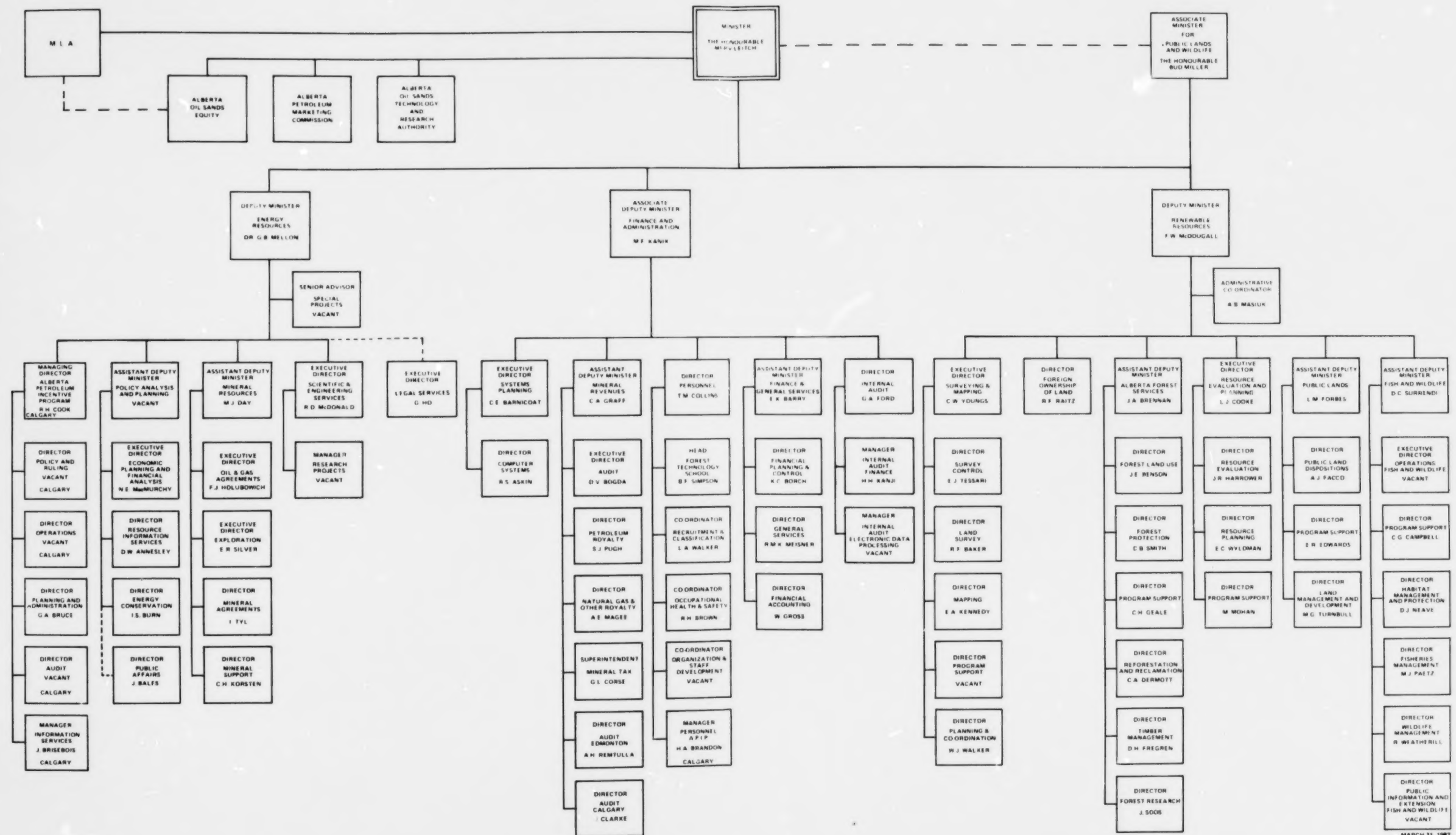
There are 16 divisions reporting to two Deputy Ministers and one Associate Deputy Minister. Alberta Oil Sands Equity, Alberta Oil Sands Technology Research Authority and the Alberta Petroleum Marketing Commission report directly to the Minister. Alberta Oil Sands Equity's activities are reported in the annual report of Energy and Natural Resources while the latter two report their activities to the Minister in separate annual reports.

Highlights 1981/82

- Revenues to Albertans from the province's natural resources totalled \$5.06 billion for the fiscal year ending March 31, 1982.
- The Alberta Petroleum Incentives Program (APIP) was created to provide direct cash payments to encourage oil and gas exploration within Alberta.
- The Government of Alberta signed the Energy Pricing and Taxation Agreement with the Government of Canada September 1, 1981, and implemented it.
- The Natural Gas Pricing Agreement Act was amended November 20, 1981, in accordance with the Energy Pricing and Taxation Agreement, to provide a stimulus to increase sales of Alberta natural gas in eastern Canada. All gas sales incremental to 1981 levels will be priced at 70 per cent of the Alberta border price. The 30 per cent difference will be transferred to the federal government to be used exclusively to promote the development of natural gas markets in eastern Canada. These funds are to be used primarily for subsidizing new trunk pipelines (i.e. Trans Quebec and Maritime Pipeline Inc.) and associated distribution facilities.
- Amendments to the Mines and Minerals Act were passed by the Alberta legislature, notably those relating to the reversion to the Crown of deeper rights under petroleum and natural gas leases.
- The Department was reorganized into three major areas: Energy Resources, Renewable Resources and Finance and Administration. There are 16 divisions reporting to two Deputy Ministers and one Associate Deputy Minister.
- The Alberta Bureau of Surveying and Mapping was transferred from Alberta Transportation and reports to the Deputy Minister of Renewable Resources. This division is responsible for the overall coordination of government surveying and mapping activities and for implementation of primary programs in this field.
- The first steps in the creation of a complete Natural Resources Information System were taken by the Resource Evaluation and Planning Division (REAP) with the acquisition of a computer graphics system and approval for the implementation of the Land Status Automated System.
- REAP also implemented further regionalization with regional resource coordinators being placed in four regional headquarters.
- The internal audit function was re-structured with additional resources and a new mandate, as part of the reorganization of the finance and administration activities. This internal audit program stresses assistance to management through review of financial and operating controls and assessment of accomplishments.
- Fire suppression costs reached a record \$60 million. A total of 1 556 fires burned 1.3 million hectares. More than 99 per cent of the loss was from lightning starts, and almost 28 million cubic metres of wood were destroyed, fortunately much in low-value timber lands of the Athabasca and Footner Lake forests.
- The Alberta Forest Service (AFS) also battled the mountain pine beetle, with success in limiting its spread from southern Alberta.
- Planning was begun on the Brazeau Timber Development Area in west-central Alberta. The area is divided into the Nordegg and O'Chiese blocks.
- Fish and Wildlife Division formulated policy guidelines for fish and wildlife resources and reorganized headquarters staff through the appointment of an executive director of operations, and additions and changes to the division's branches.
- The Fish and Wildlife Division is involving the public in its activities as much as possible, specifically by forming a committee to simplify hunting regulations, and expanding the Trapper Compensation Review Board to six from three members.
- Public land posted for agricultural disposition totalled 1 821 quarter sections, down from 1 907 last year. New settlement land is south of Valleyview, northwest of Hythe and in Cleardale.
- The number of grazing lease applications dropped by 15 per cent from the previous year.

Organization Chart — Alberta Energy and Natural Resources

Organization Chart - Alberta Energy and Natural Resources





Department Activities



Alberta Oil Sands Equity

Report of the Chairman
T.R. VANT

Alberta Oil Sands Equity manages Alberta's equity participation in the Syncrude project and in an exploration and evaluation program on six oil sand leases in northeastern Alberta. At March 31, 1982, there were 11 people on staff.

During the year ending March 31, 1982, the Syncrude project operated well, producing 4.95 million cubic metres, (31.2 million barrels) of synthetic crude oil as compared with 4.85 million cubic metres, (30.5 million barrels) in the previous year. The third quarter of 1981 was a record quarter with 1.67 million cubic metres (10.5 million barrels) of synthetic crude oil produced.

The production of 4.95 million cubic metres was achieved even though both cokers were shut down for maintenance during the year. Coker 8-1 was shut down on April 16, 1981, ending a 400-day run. It was brought back into production on June 16, 1981, and was still operating at March 31, 1982. Coker 8-2 was shut down January 4, 1982, and started up March 15, 1982.

The imposition of the Petroleum and Gas Revenue Tax (PGRT) feature of the federal government's National Energy Program placed an additional burden on the Syncrude project. There have been several subsequent adjustments to the PGRT with the current effective rate of the PGRT being 11 per cent for the last seven months of 1982 and eight per cent for 1983 and 1984.

The Syncrude owners, reacting to a reduced cash flow from the project, have instituted a cost control program aimed at improving the cash flow from the project. As well, they are currently reviewing the Debottleneck Program which could increase the production of the project by approximately 1.03

million cubic metres (6.5 million barrels) of synthetic crude oil per year. However, the Syncrude owners have not yet reactivated any expansion activities because of the unfavorable economic conditions.

Effective January 1, 1982, Alberta exercised the conversion options on two convertible debenture loans which had been provided to Canada-Cities Service Ltd. and Gulf Canada Resources Inc. Under the terms of the options, Alberta converted the \$236 million of debentures into an additional 8.74 per cent equity interest in the Syncrude project, which brings Alberta's interest to 16.74 per cent.

Alberta's investment in the Syncrude project produced a net profit of \$26 947 000 for the fiscal year ending March 31, 1982, compared with a net profit of \$27 277 000 for the previous fiscal year. Since Alberta is not paying the Petroleum and Gas Revenue Tax on her equity share of production, the profit numbers have not been reduced by the amount of the tax. At March 31, 1982, Alberta's investment in the project amounted to \$439 024 000, consisting of capital provided by the Alberta Heritage Savings Trust Fund of \$389 199 000 and accumulated profits of \$49 825 000.

Alberta Oil Sands Equity, representing Alberta's 10 per cent interest, is participating in an evaluation program on six oil sand leases located in northeastern Alberta. The program is evaluating the potential of developing an oil sands plant on one of the leases. The current schedule is to have the necessary information in order to make a decision on commercial production available for the owners by the mid-1980s.

Alberta Petroleum Incentives Program

Report of the Managing Director
R.H. COOK

The Alberta Petroleum Incentives Program (APIP) provides direct cash payments to encourage oil and gas exploration within the province. Under the program, eligible applicants can apply for incentives against their incurred eligible exploration and development expenses and for asset costs of tertiary recovery equipment. Costs and expenses must be incurred during the period beginning January 1, 1981, and ending December 31, 1986.

The original concept of direct cash payments was introduced by the federal government in 1980 through the National Energy Program. These incentives were designed to offset the loss of deductions formerly available to Canadian-owned firms through the earned depletion allowance.

The province's decision to assume the program's activities within Alberta was part of the Energy Pricing and Taxation Agreement signed by the two governments in September, 1981. APIP is fully funded and administered by the provincial government under the auspices of Alberta Energy and Natural Resources.

The program is headed by a managing director and is composed of six branches.

The Operations Branch is divided into validation and assessment teams and a records management group. This branch processes applications for incentives, coordinates data and can, if necessary, request audits.

Policy and Technical Services Branch is responsible for interpreting the APIP regulation and providing rulings for industry. Its technical experts also conduct studies and analyze special applications.

Planning and Administration Branch develops systems for program planning and evaluation and provides financial management.

The Audit Branch conducts compliance audits and reviews the financial arrangements of selected companies.

All internal and external communications functions are carried out by the Communications Branch, including media relations, enquiries services, industry liaison and information services and production of informational materials.

The Personnel Branch handles the recruitment, selection and training of APIP staff.

APIP has grown from a concept to an operational program in six months. Negotiations between the federal and provincial governments began in the spring of 1981 regarding Alberta's proposed

assumption of the federal PIP program in Alberta. They culminated in the September signing of the Energy Pricing and Taxation Agreement, and planning for APIP began.

In October, a managing director was appointed. He and departmental officials, assisted by external consultants, started to develop the structure and systems that would eventually form the program. By March, they had composed six drafts of the regulations and had assisted in the writing of the legislation which was passed by the Legislative Assembly in November.

An industry advisory committee was created in December and will continue throughout the life of the program. Composed of members of the Independent Petroleum Association of Canada (IPAC), the Canadian Petroleum Association (CPA) and selected oil and gas companies of varying sizes, the committee advises the managing director of industry concerns and requirements. It also reviews drafts of the regulation and application forms, providing valuable feedback.

By January, the program operated from two locations - an Edmonton office and a Calgary office, where most of the staff is situated. The Calgary location was selected to be the permanent APIP site because of its proximity to its clients, the resource industry.

Staffing began in January and by March 31, 60 people had been hired, with 18 openings slated for immediate recruitment.

One of APIP's first projects was the completion of *Applied APIP*, a newsletter sent to industry to announce the program's start and its services. The applications guide and program description have been drafted and will be sent upon the acceptance of the regulations by Cabinet.

During February and March, APIP staff refined and evaluated the systems that will efficiently process the expected heavy volume of incentive applications.

The APIP program is a relatively complicated one and staff seek to assist industry to overcome obstacles in obtaining incentives. APIP is highly service-oriented and its goal is to provide as much encouragement as possible to the exploration and development sector of the province.

Policy Analysis and Planning Division

Report of the Executive Director
N.E. MacMURCHY

The Policy Analysis and Planning Division is responsible for the coordination of all Department matters relating to economic and financial services, resource information services and energy conservation. This includes providing resource and financial information on specific resource projects, resource revenue policies, revenue forecasting, industry revenue and the assessment of the effect of royalty and tax regimes in Alberta's resource industries. In addition, it involves the gathering and dissemination of information relating to energy and renewable resources and energy conservation, encompassing library services, publications, and public education and awareness programs.

The division is divided into the Economic Planning and Financial Analysis Group, the Resource Information Services Branch and the Energy Conservation Branch. Public Affairs comprises a permanent staff of five seconded from the Public Affairs Bureau.

The permanent staff count for the division was 48, as of March 31, 1982.

ECONOMIC PLANNING AND FINANCIAL ANALYSIS GROUP

The Economic Planning and Financial Analysis Group is responsible for providing analysis and interpretation of economic and financial data relating to the province's energy and natural resources for input into the formulation and administration of relevant government policies.

The group comprises three sections: Financial Analysis, Economic Planning and Resource Economics and Utilization.

During the 1981/82 fiscal year, this group was occupied with analysis related to three major areas. These were: (1) the discussions and negotiations between the federal and provincial governments which culminated in the September 1, 1981, Energy Pricing and Taxation Agreement, and follow-up activities required to implement the agreement; (2) the development of the Alberta Oil and Gas Activity Program; and (3) the Alsands discussions and negotiations.

The activities of the groups included: (1) provision of background information to the Minister of Energy and Natural Resources and to senior departmental officials; (2) the analysis of energy policy proposals analyzing economic impacts on the energy industry, the Albertan and Canadian economies, and the federal and provincial governments; and (3) assistance in the development of policy by examining the economic and financial implications of various policy alternatives being considered.

The critical energy issues outlined above resulted in a very heavy workload in 1981/82 for this group, and left little time to work on other areas and issues.

The Financial Analysis section conducts financial and economic evaluations and provides the primary source of input into policy analysis and recommendations in the areas of royalty and taxation policy, financial analysis and economic viability of existing and proposed resource developments, revenue forecasting, and in on-going reviews of the national and international climate for investment in energy and natural resource projects.

In the past year, this section conducted a wide range of related analyses including:

- Assessments related to the impact of various changes to the Alberta petroleum royalty system on industry and the Alberta government.
- Those relating to negotiations leading to the September 1, 1982, energy agreement, including revenue distribution and industry and government impact evaluations.
- Evaluation of a variety of fiscal regimes for the Alsands project.
- Estimation of provincial energy-related revenues.

The Economic Planning Section conducts economic analysis and generates recommendations concerning the pricing of energy resources, the impact on the economy of various energy policies and projects, the forecasting of demand for energy resources and other economic analysis required by the Department in its development and administration of energy and other natural resources policies.

During 1981/82 the Economic Planning Section activities included:

- Monitoring of international energy prices and examining the implications of these prices to Canada and Alberta.
- Analysis of demand for energy, especially Alberta crude oil and natural gas, in Canada under various policy alternatives.
- Examination of energy demand in the United States, with the view of determining market potential for Canadian natural gas.
- Continued support of the Alberta Energy Resources Allocation model developed by the Alberta Research Council and extension of this modelling work toward a limited version energy-economy interactions model.

The Resource Economics and Utilization Section is responsible for the generation of policy analysis and recommendations on the supply of hydrocarbons, mineral royalty development, the technical and economic viability of major resource

projects and developments in the production, processing, distribution and marketing of energy resources.

In the past year, the section:

- Evaluated coal slurry pipeline economics.
- Conducted reviews of international crude supply prospects.
- Evaluated a proposal for underground storage of natural gas.
- Represented the Department at a number of Energy, Mines and Resources and National Energy Board meetings, including the Emergency Supply Allocation Board meetings on Canadian crude oil supply.
- Reviewed specific aspects of the coal royalty provisions.
- Examined individual petrochemical developments.
- Undertook evaluation of enhanced oil recovery project applications for royalty relief, and commenced work aimed at streamlining the process of applying for, evaluating and administering these applications.

RESOURCE INFORMATION SERVICES BRANCH

The Resource Information Services Branch develops and distributes technical and general information for public and department consumption. The branch provides services through the Library, Publications and Resource Intelligence. When fully staffed, the branch has a complement of 17. As at March 31, 1982, the staff complement was 13, with four vacancies.

Early in the fiscal year, Public Affairs, which had been part of Resource Information Services, formed a separate branch reporting to the Assistant Deputy Minister, Policy Analysis and Planning. Thus the report of the Public Affairs Branch is no longer contained in the report of Resource Information Services.

The Library provides technical reference and general information services for Department staff and others with technical reference requirements in the program areas administered by the Department.

Operations of the Library functioned smoothly in the first several months of the fiscal year. Towards the end of the period a high staff turn-over caused the curtailment of some promotional efforts, additions to the Canadian Selective Dissemination of Information (SDI) profiles and monthly feature displays. The programs will be continued when the Library staff situation is resolved. The Library continued to investigate automated cataloguing systems with a view to selection and implementation in the next fiscal period.

The Publications section assists in the planning, production and distribution of Department publications, with emphasis on technical publications.

Highlights of the fiscal year included:

- Acquisition of word processing equipment and its subsequent use in production, distribution and cataloguing of a variety of technical and general publications.
- Response to thousands of requests for publications as a result of issuing the General Publications Catalogue and Technical Publications Catalogue in the previous fiscal year, and two editions of those catalogues in the year under review.
- Coordination and production of the Department's annual report.

Resource Intelligence gathers information by reviewing the scientific, business and industrial media as well as Alberta and other Canadian dailies and a selection of Alberta weekly newspapers. The information is circulated as-is, or analyzed for implications to Alberta and separate reports are developed for management. In addition, this section responds to requests for information received from the public and develops material to answer those requests.

Highlights included:

- Development of the first three of a series of brochures on energy resources — an overall brochure to answer the most general questions, and more in-depth materials on conventional crude oil, and natural gas. These brochures were brought to final production stages, with printing and distribution scheduled for the next fiscal period.
- The preparation of industry activity articles for *The Northern Miner*, *The Western Miner*, *The Financial Post* and others.
- Further enhancement of the monthly *Resource Reporter* for senior management, through divisional input and expansion of distribution.
- Major monitoring programs conducted in industry reaction to the Energy Pricing and Taxation Agreement of September 1, 1981, and industry reaction to the National Energy Program.

In addition to the programs detailed above, the branch was active in a number of special project areas. Most notable were the production and distribution of the Department's major publication *Oil Sands and Heavy Oils of Alberta*, preparation of an oil sands display for the Canada Pavilion at the World's Fair in Knoxville, Tennessee, and the prepa-

ration of materials for briefing official visitors to the province.

PUBLIC AFFAIRS

During the fiscal year 1981/82, the Department of Energy and Natural Resources undertook three new initiatives in its approach to public communications.

Recognizing the increasing importance of effective, two-way communication with its publics, the Department first agreed to establish Public Affairs as a separate branch. This branch now includes a permanent staff of five, seconded from the Public Affairs Bureau. The branch is responsible for a wide variety of public communications projects, ranging from identification and planning for emerging issues of importance, to public relations counselling; film and audio/visual production, preparation of brochures, pamphlets, news packages and resource textbooks, design and development of theme displays, and a full range of media liaison activities.

To emphasize the Department philosophy of integrated planning and management of Alberta's resources, the branch developed, and the Department accepted, an overall theme *Fitting the Future Together*, which will provide the foundation of future programming.

Public Affairs, acting on behalf of the Department, also undertook a co-operative effort with Alberta Education in support of that Department's developing Land & Life curriculum. Land & Life is designed for Grades 9 through 12, an important audience for resource information.

Strongly supporting these commitments to increased public communication, the branch developed and implemented a critical path project follow-up system. That system has since recorded monthly project growth from 85 projects in February, 1981, to more than 250 projects at the end of the fiscal period. Project highlights for the year included the handling of media liaison for the Swan Hills forest fire and the production of a 20-minute documentary film recording the successful work of the Alberta Forest Service during that crisis; the design and production, for the Finance and Administration Division, of the first of a series of Departmental policy and procedure manuals; research, writing and marketing of the Alberta Energy Saver program for the Energy Conservation Branch, and the handling of a number of special presentations and ceremonies for the Fish and Wildlife Division, including co-operative efforts with several non-governmental organizations.

ENERGY CONSERVATION BRANCH

The Energy Conservation Branch is responsible for the development and implementation of awareness, information and education programs emphasizing the efficient use of energy. The branch works closely with other Alberta government departments and agencies, other provincial and federal governments, and energy utilities in order to minimize program duplication and to share materials or offer joint programs where practical.

In conjunction with these other agencies, the branch offers technical assistance in the evaluation of potential programs, policies, incentives, or regulatory revisions which are directed to increasing the efficiency of energy end-use in Alberta.

During 1981/82, the branch carried out three main program functions involving direct services to identified target sectors: (1) Industrial Energy Conservation Program, aimed at business, industry and institutions; (2) residential/transportation conservation programs aimed at households; and (3) school conservation programs for school children and teachers.

(1) This was the first full year of operation for the Industrial Energy Conservation Program. The objective of this program is to increase awareness in business and industry of the opportunities to reduce operating costs by using energy more efficiently. The program includes basic energy audit services offered on request at no charge to businesses, industries and institutions which consume large amounts of energy. In 1981/82, 97 audits were conducted in all regions of the province. Facilities audited include heavy industry, agricultural installations, commercial buildings, recreational installations and institutional complexes. Total energy use at these facilities was over 3.6 petajoules (PJ) (1 billion kWh) per year, representing an annual cost of more than \$12 million (based on energy costs at the time of the audits). Of this total, audits concentrating on simple measures to reduce energy use identified potential energy savings of more than 0.88 PJ (244 million kWh) for a cost reduction of more than \$2.3 million per year at the facilities audited. This service is a federal-provincial cost-shared program.

Other Industrial Energy Conservation Program activities included 27 presentations to conferences, seminars, business and industry groups; program-related advertising; inter-departmental liaison; acquiring technical information; assisting with energy conservation efforts in Department facilities; and reviewing energy efficiency aspects of Energy Resources Conservation Board industrial development permit applications.

(2) The branch's residential/transportation programs have concentrated on developing, distributing and promoting information materials for the general public and the building trades. During 1981/82, a new series of seven booklets was researched, written, and illustrated. By the end of the year, six of these were available to the public. This Alberta Energy Savers Series includes how-to information for the interested layperson on techniques and materials to apply to specific energy conservation projects in the home.

The branch collaborated with Alberta Environment in jointly sponsoring the Clean Air Saves Energy program during July and August, 1981. This program offered free voluntary automobile exhaust emission analysis and carburetor adjustment to the public to help promote proper vehicle engine tuning as a means of reducing air pollution and increasing gas mileage. A total of 3 009 vehicles in the province's four largest urban centres were tested. Of these, 36 per cent were found to be adequately tuned according to exhaust gas analysis.

A variety of other new publications and jointly-sponsored projects was undertaken during the year. On-going distribution of publications by the branch to the general public via displays, other government agencies or direct requests was about 210 000 publications this year. The branch responded to a broad range of public inquiries which averaged about 400 per month.

(3) School programs continued to provide educational curriculum support in the field of energy conservation to the province's classrooms during 1981/82. The Rural School Visitation Program developed a Division I (up to Grade 3) level puppet show, and continued to concentrate on two-person presentations at the Division I and 2 (Grades 4 to 6) level. Over the course of the year, the program team visited 187 schools in 19 school jurisdictions around the province, involving approximately 20 500 students and 900 teachers and disseminating energy conservation materials which fit into the Alberta Education curriculum for on-going use by teachers and students.

A Curriculum Support Program was initiated to develop, test and produce activity-oriented classroom materials for ready use by teachers, as appropriate to the grade-specific Alberta Education curricula. Multi-faceted Grade 3 and Grade 4 materials were produced. Preliminary work on a Grade 6 kit was undertaken, to be available in 1982. A series of workshops and displays was used to introduce teachers and teachers-in-training to these materials. About 30 000 of these publications were distributed to Alberta schools on request.

Continued support in the area of student in-

volvement was also offered to Alberta Education's Fifty School Conservation Pilot Project.

In addition to these programs the branch sought to improve information-sharing in the rapidly-developing energy conservation field by introducing a new monthly publication, *Energy Conservation Update*, for circulation to Alberta government officials, other governments and key public agencies, and professional groups within the province.

The branch commissioned a major study of municipal energy conservation interest and initiatives within Alberta during the year and prepared a report on this topic for publishing in 1982.

Mineral Resources Division

Report of the Assistant Deputy Minister
MICHAEL J. DAY, P.Geol.

The Mineral Resources Division is responsible for formulating mineral resource policy, recommending legislation, and exercising ministerial discretion in the administration of all aspects of the Mines and Minerals Act and regulations other than those dealing with royalty and marketing. The minerals involved include coal, natural gas, oil sands, petroleum, and a wide range of evaporitic, industrial, and metallic minerals owned by the Crown in right of Alberta, but excluding sand, gravel, clay, marl and peat which can be stripped, and are the property of the surface owner.

Major management aspects include the disposition processes for mineral rights and the maintenance of dispositions, most of which are subject to complex tenure requirements. As a key component of these processes, the division continued to increase its involvement during the year in land use planning and conflict resolution, with the objective of encouraging non-renewable resource exploration and development where compatible with other land uses and the environment.

In addition to minerals management, the division reviews, coordinates, and issues approvals for mineral exploration activity by industry. A field staff of exploration inspectors is responsible for investigating complaints arising from exploration activity in the settled portions of the province, and for recommending remedial action and penalties to operators of exploration equipment found to be in contravention of the exploration regulations.

Effective March 1, 1982, the division made two line changes to maximize efficiency.

The Oil and Gas Agreement Sales Branch which was composed of mineral planning and oil and gas sales was discontinued.

The staff and function of oil and gas agreement sales were incorporated into the Oil and Gas Agreements Branch while the mineral planning function and staff were incorporated into the Exploration Branch.

With this change in organizational structure, the division's responsibilities are now grouped into three line branches and one support branch.

As of March 31, 1982, the staff count was 130 permanent positions. Fifteen of the 19 managerial positions and 103 of the 111 non-managerial positions were filled.

OIL AND GAS AGREEMENTS BRANCH

This branch is responsible for the issuance and maintenance of all Crown petroleum and natural gas agreements. Those currently being issued included licences and five-year term leases of petroleum and natural gas rights (under legislation

which became effective July 1, 1976) together with 10-year term petroleum and natural gas leases, natural gas licences and 21-year term natural gas leases derived from subsisting petroleum and natural gas reservations.

The reduction in the number of petroleum and natural gas reservations during the fiscal year and the attendant decrease in administrative work load associated with exploration agreements facilitated the reorganization of the branch into three sections, namely Oil and Gas Agreements Administration, Oil and Gas Lease Continuation, and Unitization. Without increasing staff, the reorganization enabled the branch to consolidate related administrative functions, as well as to strengthen the staff complement responsible for administering and processing the increasingly complex and heavy work load associated with continuation of oil and gas leases and the reversion of the deeper rights effective July 1, 1981.

Petroleum and natural gas reservations ceased to be issued June 30, 1976. Only 24 petroleum and natural gas reservations were still in effect March 31, 1982; all are expected to be terminated by the end of calendar year 1982. Exploration for the Crown's oil and gas resources in Alberta is now conducted under petroleum and natural gas licences. Table I indicates the number of transactions, by type of agreement, carried out by the branch during the fiscal year.

All 10-year leases which reached the end of the sixth year of their terms during the fiscal year, and on which a well had not been drilled, were subject to drilling requirements for which statutory provision was made in 1972 and more specifically prescribed in 1976.

Those 10- and 21-year leases that continued producing will be subject to reversion of rights below the base of their productive zone on January 1, 1983, or at the end of their respective 10- and 21-year initial term, whichever occurs later. The Department commenced issuing five-year petroleum and natural gas leases on July 1, 1976, and the first of these leases became subject to reversion of deeper rights on July 1, 1981.

Substantial discretionary authority is exercised, particularly in regard to lease continuation, necessitating geological, geophysical and engineering input from, and liaison with, the Exploration Branch, the Energy Resources Conservation Board (via the Department's senior technical advisor — geology, in Calgary), and the lessee.

During the fiscal year, 3 522 individual petroleum and natural gas leases whose terms of 10 and 21 years expired during the year were reviewed to determine if they qualified for continuation. Of the total, 2 272 leases were continued by reason of

established productivity or probable productivity. Those 269 leases or portions of leases considered to be probably productive were continued for a further year and involved the payment of a security of \$25 per hectare for the portion so continued. The return or refund of the security is contingent upon a well being drilled on each such lease to determine whether or not it is underlain by a productive oil or gas pool.

Of the 436 leases continued as unproven areas for a further one-year period during the preceding fiscal year, 321 were continued as productive, 112 cancelled, and three continued for a further period of one year.

To the end of December, 1981, some 13 000 leases having initial terms of 10 or 21 years had expired and were continued by reason of established productivity. In accordance with the provisions of the Mines and Minerals Act, on January 1, 1983, the petroleum and natural gas rights below the base of the deepest productive zone in each such lease will revert to the Crown. To obviate administrative errors and problems, the lessee of each continued lease has been notified of the zone below which all rights are expected to revert to the Crown, giving him/her ample opportunity to make representations concerning discrepancies between his/her records and the Department's. The notifications were given in January and February, 1982 and represented the culmination of a massive two-year review of all productive leases whose 10- or 21-year term had expired.

The branch's responsibilities, in regard to unit agreements, are to ensure that the terms and conditions of Crown leases are not negated and, where diversity of mineral ownership exists, to further ensure that the Crown's royalty participation is equitable. During the year, seven new unit agreements pursuant to Part Nine of the Mines and Minerals Act (Revised Statutes of Alberta 1980) became effective for petroleum or natural gas, and four existing unitized areas were enlarged. The Clive North Basal Quartz Unit was terminated effective May 1, 1981, as the unitized pool had become depleted. This branch is also responsible for processing requests from lessees for consent of the Lieutenant Governor in Council to the use elsewhere of natural gas produced in the province.

Tables 1 and 2 enumerate many of the transactions of the Oil and Gas Agreements and Mineral Agreements Branches.

Oil and Gas Agreement Sales is responsible for the sale of undisposed petroleum and natural gas rights by lease or licence in such a manner as to ensure that the private sector will continue to do exploration work in the form of drilling. The practice

of holding public offerings in Calgary was continued and 24 offerings were held during the fiscal year.

Bonus consideration from the sale of 1.48 million hectares (3.70 million acres) of petroleum and natural gas leases and licences amounted to \$557 million, down 25.9 per cent from the previous fiscal year.

Highlights of the year and detailed statistics of oil and gas agreement sales appear in the Alberta Resources Industry Activities and Statistics sections.

MINERAL AGREEMENTS BRANCH

The Mineral Agreements Branch is administratively responsible for the granting of leases of all Crown mineral rights, other than petroleum and natural gas, including oil sands, coal, metallic ("quartz"), industrial ("quarriable"), placer and evaporitic minerals.

The branch also administers special mineral leases such as underground storage caverns and other special agreements, and issues placer mining permits to individuals wishing to operate small placer mining operations within the scope of the Placer Mining Regulation.

During the fiscal year, there were no further public offerings of coal rights for sale, although the branch continued to process coal applications and issue Crown coal leases in areas not withdrawn from disposition.

The sale of coal rights has been stopped temporarily while a revision of the Coal Development Policy for Alberta, as stated in 1976, is being undertaken.

On 31 December, 1981, the first-cycle work program on oil sands leases ended and the results of the five-year cycle are being examined. The branch continued issuing oil sands prospecting permits and leases to holders of qualified petroleum and natural gas agreements and to holders of oil sands rights below or above the leased oil sands rights.

Revised forms are being prepared for new oil sands leases and their first renewals.

A new draft of the Metallic Minerals Regulation is presently under discussion.

The Mineral Agreements Branch, in conjunction with the Mineral Revenues Division, is responsible for the administration of the Mineral Rights Compensation Regulations for rights administered by the branch. During the 1981/82 fiscal year six claims were processed, comprising 32 coal leases and one quarriable minerals lease, and \$654 045 was paid to the lessees as compensation. The branch continued refunding the work deposits

received from previous coal rights sales and \$1 502 146.07 was refunded against designated exploration expenses by coal lessees.

EXPLORATION BRANCH

The Exploration Branch provides geological and geophysical input to minerals policy and administration, administers the exploratory drilling and geophysical incentive programs and processes all incoming geophysical and exploration applications and reports. The branch carries out field inspections of exploration activities and landowner complaints. Landowner complaints have decreased 13 per cent from the previous year. Of the 373 complaints received during the past fiscal year, 333 were resolved at fiscal year end.

Amendments to the Geophysical Incentive Program on April 1, 1981, increased the credit granted to reflect approximately 35 per cent of field recording costs per kilometre. The special incentive feature was continued in the 1981 regulation, enhanced to a rate of up to \$5 000 per kilometre for techniques which would reduce environmental damage in the foothills or involved application of an

innovative recording method which could be utilized province-wide. Credit per kilometre for conventional operations was increased, resulting in an 80 per cent increase over the previous year — 1 289 programs were certified in 1981/82 as opposed to 715 in 1980/81. The boundary of the foothills area was amended in March, 1982, to more accurately reflect topographic features and further define the geophysical incentive credit areas from the exploratory drilling incentive credit areas. The credit certified increased by 289 per cent, indicative of whole-scale industry support for the amended program.

The credit schedule was adjusted in the Exploratory Drilling Regulation, 1981, to reflect increased well costs. However, a decrease of 30 per cent in exploratory wells certified was noted and can probably be attributed to the decreased drilling activity of the oil and gas industry due to worldwide economic conditions. Certified depth intervals decreased by 18 per cent and certified credits decreased by three per cent.

There were 363 exploration licences and 103 exploration permits listed as currently active during the 1981/82 fiscal year, an increase of 42 licences and five permits over 1980/81.

Scientific and Engineering Services Division

Report of the Executive Director
R.D. McDONALD

The Scientific and Engineering Services Division provides technical staff services to the Deputy Minister and the other divisions and groups within the Department of Energy and Natural Resources. In addition, the division has responsibility for the day-to-day administration of the Alberta/Canada Energy Resources Research Fund. Total staff as of March 31, 1982, was nine with four positions vacant.

Technical input was provided into a variety of departmental activities including coal development, reclamation, and the impact of oil and gas-related development and research. The development of the province's extensive coal resources is a major economic opportunity. Several activities of the division relate directly to facilitating this development including the completion, in co-operation with the Economic Development Department, of an engineering study describing the potential for slurry pipelining of thermal coals to tidewater, the planning for establishing a coal research and development funding program and assisting with an update of the coal development policy.

Other activities were conducted in co-operation with other divisions. These include a program to assess the effects of oil and gas plays on other natural resources in the region, initiating studies to determine the future impact of synthetic fuels on the supply of liquid hydrocarbons and an assessment of alternative processes for extraction of bitumen from oil sands.

The Interdepartmental Reclamation Research Technical Advisory Committee, chaired by a member of the division, managed the province's Reclamation Research Program. Funding of \$1.5 million from the Alberta Heritage Savings Trust Fund supported 18 research projects related to reclamation of coal and oil sands mining lands.

The Alberta/Canada Energy Resources Research Fund, administered by staff in the division, supported 45 projects to a total of \$9 million. Support continued for research and development projects related to conventional oil and gas and related technologies, but major expansion occurred in support of coal conversion, particularly into liquid fuels, energy conservation and renewable energy.

During the fiscal year, members of the division served on a number of committees and task forces including the Alberta/Canada Energy Resources Research Fund Committee; Keephills Power Station Citizens' Steering Committee; Interdepartmental Reclamation Technical Advisory Committee; and technical advisory committees for the Coal Mining Research Centre; Petroleum Recovery Institute and the Computer Modelling Group as well as a number of research project management committees. The executive director served on the board of directors for the Petroleum Recovery Institute and the Computer Modelling Group.

Legal Services Division

Report of the Senior Solicitor
G.B.N. HO

The Legal Services Division provides legal services to both the Renewable and Non-Renewable Resources areas of the Department. Major areas of responsibility include drafting, reviewing and revising legislation, regulations, ministerial orders, agreements and other legal documents. The division also provides legal opinions and interprets statutes upon request.

As of March 31, 1982, the division consisted of four lawyers seconded from the Attorney General's Department and a permanent support staff of four.

NON-RENEWABLE RESOURCES

(1) New Legislation

The Petroleum Incentives Program Act was enacted to provide the necessary legislative authority to establish and operate the Alberta Petroleum Incentives Program.

(2) Amendments to Legislation

(a) Mines and Minerals Act - Amendments to the Mines and Minerals Act were prepared and passed in the spring and fall sittings of the legislature in 1981. The amendments of note were as follows:

- Amendments to Part Five relating to the reversion to the Crown of deeper rights under petroleum and natural gas leases, and the division of petroleum and natural gas leases by the Minister.
- Amendments to Part Eight to provide for a system of registering security notices in respect of Crown mineral agreements and the priority of security interests.
- An amendment authorizing the Lieutenant Governor in Council to make regulations in respect of refundable work deposits furnished in connection with public sales of Crown mineral agreements.
- An amendment enabling the Minister to require any lessee or former lessee under a Crown mineral agreement to submit a return of information relating or incidental to the recovery and sale of minerals.
- An amendment requiring lessees and former lessees to keep within Alberta for a period of five years all records that are used in the preparation of mineral reports submitted to the Department.

(b) Natural Gas Pricing Agreement Act - The Natural Gas Pricing Agreement Act was amended to reflect the terms of the September 1, 1981 Memorandum of Agreement with the federal government. In particular, the Act was amended to authorize the Government of Alberta to enter into an agreement

with the federal government providing for the payment to the federal government of market development incentive payments, for the purpose of facilitating the expansion of markets for gas produced in Alberta in markets east of Alberta.

(3) New Regulations

The Exploratory Drilling Incentive Regulation, 1981, provides incentives, in the form of credits, in respect of the drilling of incentive exploratory wells, where drilling commenced between April 1, 1981 and March 31, 1983. Drilling credits have, since the 1980 program, been increased to approximately one-third of drilling costs.

The Geophysical Incentive Regulation, 1981, provides incentives, in the form of credits, in respect of seismic reflection programs that are certified as geophysical incentive programs, where the application for certification is made between April 1, 1981 and March 31, 1983. The 1981 program was changed from the 1980 program to include special recording methods that do not achieve minimum subsurface coverage, and to generally increase the credits allowed for incentive programs and data acquisition costs.

The Security Notice Registration Regulation was passed to specify the rules and procedures for the registration of security notices with the Department.

The Interest and Penalties Regulation was passed to authorize the minister to require any person who has failed to file a return or report to do so within a specified time. A person who fails to comply with a notice given by the Minister is subject to the monetary penalties prescribed in the notice up to the maximum penalties allowed by the regulation.

(4) Amendments to Regulations

The Petroleum Royalty Regulation was amended to specify categories of New Oil Reference Price (NORP) oil, and to provide for the calculation of royalty payable in respect of NORP oil.

The Coal Royalty Regulation was amended to extend the royalty phase-in period for new mines from three years to five years. The extended phase-in period applies to mines the commencement dates of which occur on or after September 1, 1981.

The Exploration Regulation was amended to provide access onto leased roadways, after giving the required notice, to operators of exploration equipment who are unable to gain access after attempting to negotiate in good faith.

RENEWABLE RESOURCES

(1) Amendments to Legislation

The Land Agents Licensing Act was amended to authorize the Lieutenant Governor in Council to provide for different classes of land agents' licences, and to specify the terms and conditions of such licences.

(2) New Regulations

The Licence of Occupation Regulation, 1981, was passed to update procedures for the issuance of licences and to provide better control of commercial use of licensed areas used as roads.

The Forms Regulation was passed to provide for the forms to be used as notifications and notices of seizure under the Public Lands Act.

The Forest Technology School Rates Regulation, 1981, was passed updating charges respecting the Forest Technology School at Hinton, Alberta.

The Falconry Regulation was passed to allow the use of falcons to hunt wildlife, under certain conditions.

The Subsistence Hunting Regulation was passed authorizing the hunting of moose out of

season by individuals who are, or whose family members are, in dire need of sustenance.

The Hunter Training and Testing Regulation was passed authorizing the Associate Minister of Public Lands and Wildlife to establish hunter training and testing programs for persons who have had their permits or licences cancelled as a result of conviction under the Wildlife Act.

(3) Amendments to Regulations

The Timber Management Amendment Regulation was passed. One major change was that authorizing the Minister of Energy and Natural Resources to restrict or prohibit the importation of forest products into Alberta if the importation would increase the damage to forest growth by insects or disease.

The Wild Fur Industry Amendment Regulation was passed. The most important change was the provision allowing owners and occupants of certain specified lands to hunt and trap fur-bearing animals and fur-bearing carnivores where that wildlife is causing or liable to cause damage to private or public property.

Systems Planning Division

Report of the Executive Director
C.E. BARNICOAT

The Systems Planning and Development Division was formed in 1981/82 as part of the new Financial and Administration sector of the Department. The division provides technical expertise and capabilities in the areas of automated data and word processing systems. The division gives this support to all divisions and all programs of the Department.

The Systems Planning and Development Division is made up of the Computer Systems Branch (data processing) and Office Automation (word processing). Together, the two cover automated information processing.

Office Automation was added to the division in late 1981/82 and is composed of one individual. The functions of the area to date have been directed toward word processing feasibility studies and word processing equipment acquisition. Feasibility studies were completed in Policy Analysis and Planning, Public Lands and the Mineral Resources Divisions. Word processing equipment was leased for the study areas, as well as Resource Evaluation and Planning Division, Alberta Petroleum Incentives Program, Internal Audit Division and some of the senior executive areas. The role of Office Automation is expected to evolve with changes in office automation technology. The staff count in the division as of March 31, 1982, was 16 permanent positions, with two vacancies.

COMPUTER SYSTEMS BRANCH

In 1981/82, highlights of the Computer Systems Branch covered four major systems developments and two major acquisitions of turnkey systems. Turnkey systems are a combination of hardware

(equipment) and software (computer programs) designed to form the solution or part of the solution to a particular problem. The systems developments included:

- Implementation of a Timber Management Planning System (TIMPLAN) to analyze long-term timber supply alternatives based on Phase 3 Forest Inventory data.
- Implementation of a computer system to assist the Department in managing the reversion of deeper petroleum and natural gas rights.
- Commencement of a large computer system to facilitate and expedite the control and analysis involved in the disposition and harvesting of timber resources. The Timber Records Enumeration and Evaluation System (TREES) is scheduled for completion in 1984.
- Continued development of a large computer system involved in the automated production of land standings in the province. To be completely implemented in 1985, the Land Status Automated System (LSAS) will be developed in phases, with the first phase due for release in 1983.

Two turnkey systems acquisitions were made to aid mapping and telecommunications. One is a message switching facility to meet the needs of the Alberta Forest Service, especially fire fighting activities. This computer-based communications network will be installed in early 1982/83. The second purchase is a system to facilitate resource and thematic mapping in the Department. This mapping system will be implemented in 1982/83.

Mineral Revenues Division

Report of the Assistant Deputy Minister
C.A. GRAFF

The Mineral Revenues Division of Finance and Administration sector of Alberta Energy and Natural Resources is responsible for the calculation, collection and verification of petroleum, natural gas, coal and other royalties. The division is also responsible for the administration and collection of freehold mineral taxes. The staff complement at March 31, 1982, was 94.

Revenues for the year were \$5.06 billion, an increase of \$72.8 million over 1980/81. Comparative gross revenues by energy sector are illustrated in charts eight to 14.

The Mineral Revenues Division comprises four branches: Petroleum Royalty, Audit, Natural Gas and Other Royalties, and Freehold Mineral Tax.

PETROLEUM ROYALTY BRANCH

The Petroleum Royalty Branch is responsible for ensuring that the Crown receives its share of revenues from production of crude oil (conventional, experimental, and synthetic) from Crown leases. The branch is organized into four functional areas: Assessment Records, Verification, Relief and Synthetic.

Additional burdens were placed on the division through legislative and systems changes arising from the September 1, 1981 Energy Pricing and Taxation Agreement and the major royalty review completed for the Energy Committee of Cabinet.

The September 1, 1981 Energy Pricing and Taxation Agreement created a new pricing formula for old conventional and synthetic crude oil and the New Oil Reference Price Program (NORP) for new oil discovered on or after January 1, 1981.

The NORP program greatly affected the administration and legislative responsibilities of the branch. Since the agreement, additional categories eligible for NORP oil have been approved and implemented.

Also during the year, the administrative responsibilities associated with the Syncrude Crown Agreement were transferred from the Auditor General.

The staff complement was 14 with one vacancy as at March 31, 1981.

AUDIT BRANCH

Field audits were completed in accordance with the policy, plans and methodology developed and

implemented during the year. The audit frequency is on a cyclical basis with selection principally determined by the amount of annual Crown royalties paid. The audits performed resulted in substantial royalty recoveries.

The staff complement was 21 with 10 staff located in the permanently established Calgary Audit office. As at March 31, 1982, there were five vacant positions, with recruitment activities in progress.

NATURAL GAS AND OTHER ROYALTIES

The Natural Gas and Other Royalties Branch collects and verifies the natural gas, propane, butanes, pentanes, sulphur, coal and other mineral royalties.

The gas royalty function is composed of four units: Verification, Gas Cost Allowance, Data Coordination and Training, and Input Control.

Many enhancements to the gas royalty computer system were implemented to result in better control over the verification process. Continuing emphasis will result in developing an improved management information system.

The September 1, 1981 energy agreement, a major review of the gas royalty regime, and the marketing of pentanes plus by the Alberta Petroleum Marketing Commission, initiated system changes which are near completion.

As at March 31, 1982, the staff complement was 42 with two positions vacant.

FREEHOLD MINERAL TAX

The Freehold Mineral Tax Branch is responsible for the administration of the Freehold Mineral Taxation Act and the Mineral Titles Redemption Act, as well as the collection of mineral taxes on Freehold Mineral Rights. The mineral taxes are based on an assessment of the fair actual value of the remaining recoverable reserves of crude oil and raw gas on freehold producing properties within the province.

Pursuant to the Mineral Titles Redemption Act, there were 13 titles remaining subject to redemption, with no titles returned to former owners during the year.

The staff complement was 15 with two vacancies at March 31, 1982.

Personnel Services Division

Report of the Director
T.M. COLLINS

The division is responsible for providing services in the areas of recruitment, classification, wage and salary administration, employee relations, staff development and occupational health and safety. The continued growth of the Department of Energy and Natural Resources necessitated increased activity in the Personnel Division. The division is composed of an office in Edmonton, a personnel office in the Alberta Petroleum Incentives Program in Calgary and the Forest Technology School in Hinton.

Employment levels in the Department increased during the year and at year end there were 2 551 permanent employees in the Department. In 1981 another 2 300 employees found employment on a temporary, casual or seasonal basis.

In the course of the year, we conducted 537 competitions for jobs and dealt with 640 classification decisions. In addition, the Department handled thousands of queries from employees and potential employees on a broad range of personnel-related activities.

Staff development and employee training received a great deal of attention. During the year, 46 programs were conducted in the Department, some with the assistance of the Personnel Administration Office and some with advice from outside consultants. A total of 1 400 employees participated in these programs.

The Forest Technology School continued to provide education services to the Department and other agencies. Enrolment remained at a level simi-

lar to last year's, but a notable shift to fire control courses was evident. Two new fire courses were developed in response to needs identified during the severe fire season. Eleven hundred and twelve people attended resource management short courses. Eighty-six additional courses, meetings and seminars were hosted. Approximately 1 800 people received some form of training at the school this year. Use of the school by the Yellowhead Region Education Consortium increased significantly.

A total of 1 178 people were accommodated in the student residences. The food services section served 52 381 meals at a cost per meal 11 per cent lower than last year. A plan to renovate Mountainview Residence was developed and architectural planning is underway.

The number of students in the Forest Technology program climbed to 56. In 1981, graduates found ample employment opportunities, particularly with the Alberta Forest Service.

Issues of occupational health and safety continued to gain prominence during the year. In the calendar year 1981, there were 429 injuries to our employees in the Department, including two fatalities. Days lost as a result of injuries totalled 1 314. Several new joint worksite committees composed of representatives of management and labor were created during the year. To assist in dealing with these issues, the area of occupational health and safety will require significant management attention in the next year.

Finance and General Services Division

Report of the Assistant Deputy Minister
E.K. BARRY

The Finance and General Services Division provides services to the Department in the areas of accounting, financial planning, records management, office services and drafting. The principal objective of the division is to maintain these services in an effective, efficient, and responsive manner to meet the needs of the Department. The division is organized into Financial Accounting, Financial Planning and Control, and General Services. The permanent staff count on March 31, 1982, was 236 employees.

FINANCIAL ACCOUNTING BRANCH

The establishment of the Financial Accounting Branch was a result of the reorganization of the Finance and Administration area of the Department. It continues the Department's responsibility for revenue accounting, accounts receivable, the processing of Department expenditures and asset and liability accounting. During the course of the year, the Main Accounts Receivable System (MARS) received major enhancements and, as a result, is working much more efficiently. In addition, the new positions created by the reorganization were advertised, recruited and filled.

FINANCIAL PLANNING AND CONTROL BRANCH

This branch also came into existence during 1982 as a result of the reorganization of the Finance and Administration area. The objective in creating this branch was to improve the ability of the Department to generate financial information and establish financial control procedures within the Department. It is composed of three sections: Budgetary Planning and Control, Financial Policy and Procedures, and Financial Systems.

These sections act as the coordinating group for the Department in the assembly of budget information and when new or revised financial policies are needed. As this branch is almost completely new to the Department, a major effort was required

to recruit qualified staff to fill the new positions in the branch.

GENERAL SERVICES BRANCH

This branch also came into existence as a result of the Finance and Administration reorganization and continues much of the services previously provided by Office Services. It is composed of three sections: Records Management, Crown Land Registration, and Accommodation and Support Services.

The Records Management Section is charged with the responsibility of providing records storage, retrieval and distribution services to the entire Department, mail and messenger services and forms management and microfilming. During the past year, design work for an automated system to control and track departmental files was completed and a system was purchased for operation in the fiscal year 1982/83.

The Crown Land Registrar's Section is responsible for examining and registering legal documents affecting mineral agreements, recording the status of surface and sub-surface Crown lands and selling land registration information to the public.

A computer-based land registration system is being developed by this section and the Systems External Specifications study phase was completed during the year. The system, including conversion, is estimated to cost \$6 million and take three years to complete.

The Accommodation and Support Services Section is responsible for coordinating and planning of office space, providing support functions such as furnishings, parking, drafting and telecommunications; stationery and supplies, duplicating and printing and word processing training.

During this past year the section assisted in establishing new regional offices and relocating two large divisions into new head office accommodations in Government Centre, Edmonton.

Internal Audit Division

Report of the Director
G.A. FORD, CA

The Internal Audit Division was formed during the year as part of the reorganization of the finance and administration functions of the Department. In January, 1982, the director was appointed and a new organization for internal audit activities was defined. Part of this definition included a comprehensive statement of the goal, scope and responsibilities of internal auditing in the Department which was approved by the Deputy Ministers.

The Department has had an internal audit program since 1975, but it was mainly of a financial nature directed towards the field operations. The new Internal Audit Division is more broadly based and its goal is to assist all members of management in the effective discharge of their responsibilities by furnishing them with analysis appraisals, recommendations and pertinent comments concerning the activities reviewed. While financial audits will still be of considerable importance, more emphasis will be placed on reviewing programs to ascertain whether results are consistent with established objectives. Also, major computer-based systems will be examined to determine if controls are adequate, user needs are being met and the system

is achieving its intended purposes and objectives.

The division is divided into two groups, one which performs financial and management audits and the other which reviews Electronic Data Processing (EDP) systems. Both groups work together on major audits of a large operating division of the Department.

The complement of the Internal Audit Division was increased from four to nine. At March 31, 1982, four positions were vacant. A recruitment campaign is under way and all positions will be filled early in the new fiscal year.

During the 1981/82 fiscal year, 27 field audits were completed, 38 grants under the Energy Resources Research Fund were audited and a major review of aircraft rentals and utilization was done.

An audit program for the next three years has been prepared which addresses the needs of the Department and provides management with a broad review of operations. Some audits were conducted with the help of practising firms of chartered accountants, and greater use of external audits is planned for 1982/83, particularly for the audits of grants.

Alberta Bureau of Surveying and Mapping

Report of the Executive Director
C.W. YOUNGS

On July 7, 1981, Order-in-Council 645/81 effected a transfer of the former Surveys and Mapping Branch of Alberta Transportation to Alberta Energy and Natural Resources to form the Alberta Bureau of Surveying and Mapping, with responsibility for providing:

- A geographical positioning framework for the province suitable for use by government departments and the private sector in the integration of position-dependent land-related information.
- A standardized mapping system for the province suitable as the basis for display of position-dependent land-related information.

This reorganization has assigned to the bureau the responsibility for overall coordination of government surveying and mapping activities, development and maintenance of standards, ensuring comprehensive coverage of the province and distribution of aerial photographs, maps and related information. The bureau serves as the primary interface with the federal and municipal governments and the private sector in this field and chairs the interdepartmental committee on surveying and mapping. The Surveys Act, Land Surveyors Act and Boundary Surveys Act are administered by the bureau under the direction of the Associate Minister, Public Lands and Wildlife.

The division is structured into five branches: Survey Control, Land Surveys, Mapping, Planning and Coordination, and Program Support. As of March 31, 1982, the division was composed of 118 permanent staff positions, of which 13 were vacant.

PROGRAM SUPPORT BRANCH

The Program Support branch was formed, following the establishment of the bureau, to provide the technical, administration and financial support necessary to deliver the bureau's programs. It was also decided to transfer responsibility for the distribution of maps and aerial photographs from the Resource Evaluation and Planning Division to the bureau, effective April 1, 1982. As the activities of this branch are in support of the programs of the line branches, the results are reflected in the reports of those branches.

LAND SURVEY BRANCH

The Land Survey Branch is responsible for the maintenance and preservation of the land survey system and for the establishment of a data base, composed of the coordinates of governing monuments and points of it.

Recommendation three of the Report of the Interdepartmental Review Committee on Government Surveying and Mapping Services, which suggested transfer of the survey plan examination capability to the Land Titles Office, was not implemented as scheduled due to problems associated with jurisdictional responsibilities, inefficiencies caused by the duplication of records, and shortage of office space at Land Titles Offices. The matter of transfer is subject to reconsideration by the two departments involved, in light of technological and procedural changes, when Land Titles Office space difficulties are resolved.

In accordance with Section 86 of the Land Titles Act, 4 800 land survey plans, involving surveys of subdivision development, roads, rights-of-way, well locations and retracements, were examined for compliance with the Survey Act and regulations, prior to being forwarded to the Land Titles Office for registration.

During the reporting period, seven inspection surveys were conducted. The inspection surveys were initiated as a result of the findings of survey plan examination or for the purpose of obtaining additional information to resolve land boundary disputes.

Reports were filed on two surveys conducted on the Alberta/British Columbia boundary in the area of the Deadman Pass for the purpose of changing the sinuous definition of the boundary to a conventional one.

Field returns were filled and examined and new township plans prepared for 46 sections of land in Township 101- Range 1- West of 6th Meridian, Townships 101/102- Range 25- West of 5th Meridian, Township 100- Range 22- West of 5th Meridian and Township 110- Range 11- West of 5th Meridian.

On receipt of a petition from owners of land in Township 14- Range 13- West of 4th Meridian, who alleged that part or the whole of the monuments of the original survey had disappeared and could not be found, a Ministerial Order was issued for a resurvey to replace the lost monuments.

Consulting services were provided to other departments requiring the services of an Alberta Land Surveyor for projects relating to land surveys and plans.

During the year, data bases, composed of coordinates for governing monuments and other points on the land survey system, were completed for the two major cities and five towns, with two cities and one town approximately 50 per cent complete at year-end.

SURVEY CONTROL BRANCH

The Survey Control Branch is responsible for planning and providing a survey control framework for the province, composed of monumented and photogrammetric control points, suitable for use by government departments and the private sector in the integration of position-dependent land-related information. The branch has three sections: Framework Survey Control, Municipal Survey Control and Geodetic Computation.

Framework Survey Control provides the basic survey network for the province. This on-going program covered approximately 101 000 square kilometres (39 000 square miles), clearing sites and placing 582 Alberta Survey Control markers. Positioning by an airborne Inertial Surveying System was undertaken by Geodetic Survey of Canada.

Municipal Survey Control plans and coordinates installation and maintenance of high-density survey control for municipalities. A cost-sharing arrangement is spelled out in joint municipal-provincial agreement. A total of 917 survey control markers were installed and surveyed. This included 529 in five towns under new agreements, and 388 in municipalities previously covered, for maintenance and to accommodate urban growth. This on-going program is now completed for 50 municipalities, including 10 cities, 39 towns and one county.

Geodetic Computations provided coordinate computation and mathematical adjustments as well as data management and distribution to users. The fiscal year saw 56 projects undertaken by this section, in addition to major work in preparation for readjustment on a new North American datum. All survey control data on file is being converted to the Alberta Survey control computer system in preparation for the readjustment which is scheduled for the mid-1980s. Roughly five per cent of data for the province is now converted, with target date for completion late 1984.

MAPPING BRANCH

The Mapping Branch includes four major areas: Municipal Mapping, Provincial Mapping, Research and Development, and Technical Support. The branch is responsible for establishing and maintaining provincial and municipal base mapping components, for establishing a digital mapping data base, providing thematic mapping services, coordinating provincial mapping programs, and liaising with other levels of government and the private sector on mapping systems.

Excellent progress was made during 1981/82 in implementing the programs of the Municipal Map-

ping Section of the Geo-digital Mapping System (GMS). A total of 242 cadastral maps were published at a scale of 1:1 000, with 236 of these being completed on the GMS. A total of 758 new and 178 revised 1:1 000 manuscripts were prepared for mapping in Alberta's small cities and towns. Mapping contracts were established for mapping in seven urban centres, with 74 orthophoto and contour sheets being produced at a scale of 1:5 000. A total of 13 cadastral and 27 orthophoto-line maps were published at the 1:5 000 scale. The joint production of 1:1 000 cadastral maps, with the Cities of Edmonton and Calgary, proceeded according to schedule. Manuscript coverage was completed for both cities, with 682 preliminary maps being published. Supplementary production work in the section included cadastral coordinate computation for 188 cadastral map sheets, the supply of 171 map bases to government agencies and private engineering consulting firms, and cartography for the revision of two township plans.

The Provincial Mapping Section continued the development of a new base map series and the maintenance of existing series, and experienced a significant increase, over the previous fiscal period, in the provision of thematic mapping services. A new 1:20 000 urban planimetric map was published for Red Deer and a 1:40 000 map was derived from 1:20 000 map sheets and published in Edmonton. Good progress was made on the Calgary project, with four maps being completed at the 1:20 000 scale. The 1:250 000 Provincial Access series production proceeded on schedule, with 17 map sheets being published. Preliminary development work was conducted to implement GMS production procedures, and planning initiated to conduct a pilot project for this series. The 1:750 000 series underwent a major revision during the year, and new editions of the *Transportation Primary Highway and Secondary Road Progress Charts* were published. The 1982 Alberta Road Map was completed, and a number of new and revised editions of 1:2 000 000 and 1:5 000 000 series maps were published. A total of 367 monochrome and multicolored maps, 940 map bases and 83 miscellaneous graphs, charts and forms were completed for 29 government departments and agencies.

The Research and Development Section's primary activity during the fiscal period continued to be the development and implementation of the GMS. The section provided the necessary support and maintenance services to ensure the successful implementation of the municipal mapping programs. The second phase of the system development plan was acquired and installed, and the technologist training program was upgraded to increase

effectiveness. A total of 450 ink plots, 265 photo plots and 10 scribe plots were provided, on user request. Associated research and development activities included investigation and testing of automated digitizing systems, processing of digital contour data received from mapping contractors, and liaison with the Land Survey Branch on a pilot project to upgrade the Alberta Township System coordinate file. Liaison and consultation with other existing or potential graphics users was maintained by participation at several meetings and seminars, representation on Resource Evaluation and Planning Division's Computer Graphics Mapping System project, and by conducting numerous demonstrations of the GMS capabilities. User support was also provided for the utilization of various facilities and software systems provided by the Alberta Government Services (AGS) Data Centre.

The Technical Support Section provided high-quality photographic reproduction and information distribution services to the public and private sectors. In total, 3 667 photo reproduction orders, involving approximately 10 900 m² of material, were processed for the bureau and 43 other government departments and agencies, and 40 196 copies of maps, plans, survey field notes and vertical control data were distributed on request. As a result of reor-

ganization (which was fully implemented at fiscal year end), planning was required during the fiscal period to assume additional responsibilities for contract map printing, diazo printing, microfilming, and building security services, and to transfer the distribution services function to the new Distribution Services Section.

PLANNING AND COORDINATION BRANCH

The Planning and Coordination Branch has the responsibility for long-range planning and coordination of the bureau's programs. It serves as liaison between the bureau and the Systems Planning Division of the Department and between the bureau and other government departments and the private sector in the planning and development of Electronic Data Processing (EDP) systems for the bureau. During the year emphasis was placed on maintaining existing systems during the transition of the bureau from Alberta Transportation to Energy and Natural Resources. Planning was advanced in relating the bureau's long-range objectives to future staff and resource requirements, particularly in the field of EDP systems, from which an integrated five year EDP plan for the bureau was developed for departmental review.

Foreign Ownership of Land Administration

Report of the Director
RONALD F. RAITZ

The Foreign Ownership of Land Administration is responsible for the administration of the Foreign Ownership of Land Regulations and the Land Agents Licencing Act. The administration is staffed by eight employees: the director, a review coordinator, two review officers (located at the Land Titles Office), a secretary, an on-line data operator and two clerk-typists.

This year the only legislative change to the regulations has been the requirement for corporations owning controlled land to supply directly to this office information on their share structure. This change was necessitated by the Corporate Registry of Consumer and Corporate Affairs' dropping this requirement from their regulations.

An examination of Table 12 shows that the amount of controlled land acquired by foreigners has increased from 0.2 per cent of total rural sales to 0.5 per cent. The actual increase was 3 836 hectares (9 509 acres).

Executive Council passed six Orders-in-Council in 1981/82 fiscal year providing exemptions for a total of 1 189 hectares (2 949 acres). Of these, 630 hectares (1 561 acres) were for farm consolidation exchange of land, acre for acre; 64 hectares

(160 acres) for residential development, and 495 hectares (1 228 acres) for industrial development.

Purchase by permanent residents (landed immigrants) have decreased this year, from 29 696 hectares (73 647 acres) to 24 627 hectares (60 182 acres), a decrease of 5 429 hectares (13 465 acres).

The Foreign Ownership of Land review officers at Land Titles rejected 3 291 incorrect documents, made 202 investigations and dealt with 3 576 phone enquiries. There were 207 cases in which information from Employment and Immigration Canada was required.

Table 18 shows the number of land agents licences issued over the past five years. As of March 31, 1981, there were 2 831 licensed land agents in Alberta. This is an increase from last year of 583.

It is anticipated that new Land Agents Licencing Regulations will be proclaimed before the end of April, 1982. Changes will include the creation of a new category of licence (an interim land agent licence), articling and examination requirements and standards of conduct for land agents. It is anticipated that the examinations and a land agents' reference manual will be in place by the fall of 1982.

Alberta Forest Service

Report of the Assistant Deputy Minister
J.A. BRENNAN

The Alberta Forest Service (AFS) is responsible for the management of Alberta's forest lands to ensure a perpetual supply of benefits while maintaining a forest environment of high quality. The forested lands of the province are divided into 10 forests, each with its own headquarters. The Forest Service is divided into six branches: Forest Protection, Forest Land Use, Timber Management, Reforestation and Reclamation, Forest Research and Program Support.

The number of permanent staff positions for the entire division was 765 as of March 31, 1982. Twenty-four of these positions were vacant at that time.

FOREST PROTECTION BRANCH

Forest fire and forest pest management are the major responsibilities of the Forest Protection Branch. The branch provides meteorological and communication services and aircraft coordination services for AFS.

The drought which began in 1979 continued through the 1981 fire season. Short-term relief was provided through July by light precipitation, with the result that losses to that time were considered minimal. However, with record-setting hot and dry weather during the months of August and September there was an unprecedented number of fires. Many hectares burned. The available statistics indicated that 1 556 fires occurred which burned in excess of 1.3 million hectares with costs exceeding \$60 million. More than 99 per cent of the area lost was from lightning-caused fires. An estimated 28 million cubic metres of wood was destroyed in 1981.

Despite the enormity of the fire problem in 1981, the majority of the area destroyed was in the Footner Lake and Athabasca forests and much of the losses in these forests were on low-value timber lands. In the other eight forests, losses were maintained at less than 40 000 hectares on over 1 100 fires starts.

The Moosehorn fire which threatened the town of Swan Hills broke out August 9 and was not extinguished until October 3. A record amount of suppression action on which more than \$5 million was spent eventually proved to be successful in bringing this fire under control without any assistance from the weather.

The battle for control of the mountain pine beetle in southern Alberta continued. Two million dollars were spent on the control program, and it appears that the Forest Service has been successful in limiting the spread northwards. However, large population of beetles on the British Columbia side

are threatening this province. An interagency committee formed with B.C., Parks Canada, Alberta and the Canadian Forestry Service recommended action on these critical areas. Control action has already been initiated by B.C. and Parks Canada. Monitoring of the beetle spread and continuing control action will be carried on as necessary in the coming year.

FOREST LAND USE BRANCH

The Forest Land Use Branch is responsible for the integration of resource management in forest lands under the jurisdiction of the Alberta Forest Service.

The branch assesses and controls industrial activities to minimize conflicts and protect the forest environment. Forest lands are extensively used by the public for outdoor recreation and the branch plans and develops campgrounds, group camps, day use areas and various types of recreation trails. Other important functions include management of forest lands for protection and enhancement of watershed values and for use of the forage resources by domestic stock. The Alberta Forest Service is a major client and participant in the Department's integrated resource planning program, and the branch guides and coordinates this activity within the Alberta Forest Service.

Geophysical exploration activity showed a slight increase in the number of programs approved, from 632 in 1980/81 to 656 in 1981/82. In addition, 52 other mineral exploration programs were approved. Applications for land dispositions in the Green Area decreased significantly, from 4 798 to 3 980 (17 per cent decrease), reflecting the current downturn in petroleum and natural gas industry activities. In addition to the foregoing, 2 818 timber damage assessments were processed. Under Part Three of the Land Surface Conservation and Reclamation Act, 909 reclamation certificates were issued.

Technical evaluations were made on a number of development proposals including major pipeline developments in the Deep Basin, West Pembina, Kananaskis Country, Robb, Lac La Biche and Zama Lake Regions. Major power transmission lines such as the Entwistle to Edson, Sagitawah to Louise Creek and Clairmont to Friedenstal were evaluated. Coal development in the Hinton-Edson area continues to increase with new surface and underground mines being proposed and existing mines expanding their operations.

Timber and forest protection revenues resulting from industrial operations amounted to \$468 054.55 excluding revenue collected by the Public Lands Division on land dispositions.

There were 194 pollution incidents which required some type of response by the Alberta Forest Service. A total volume of 6 972 m³ of liquid was involved. In addition, a train derailment involving 23 cars of potassium chloride required clean-up supervision.

A new training course on dangerous goods transportation was presented to the personnel of three forests. Field training in oil spill containment and recovery was coordinated for the Bow/Crow and Rocky Forests.

Reports were completed on a literature review and program recommendations for permanent range enclosures and recreation area vegetation management. Plant identification and herbarium seminars were held and herbarium collections prepared for the use of 21 forest districts.

The number of Animal Unit Months (AUM) of grazing utilized in the Rocky Mountains Forest Reserve was 74 253 AUM from a total available of 80 797 AUM. A total of 23 937 head of adult livestock grazed on 87 allotments. The revenue collected was \$171 053 from 269 permits which were issued.

A total of 544 dispositions, which includes grazing leases, permits, head-tax permits and forest grazing licences, have been issued on 271 523 ha (670 426 acres) of land in the Green Area outside the Rocky Mountains Forest Reserve.

The growing conditions on rangelands were variable across the province. Excellent growing conditions were experienced in the forest reserve while drought conditions predominated in the northern areas.

Normal watershed activities such as the collection, compilation and publication of the precipitation data from the 135 Sacramento storage gauge networks were completed.

Watershed input to integrated management plans were completed for eight areas.

The Tri-Creeks research program is still in the harvesting stage and completion of the study is not expected until at least 1987 or 1988. There is still some harvesting to be done in Wampus Basin and in all of Deerlick Basin.

Major projects were undertaken this past year:

- A program for digitizing and plotting streamflow records from streamflow water level recorders has been developed and tested.
- Much work has gone into adapting (for Alberta conditions) a procedure entitled Water Resources Evaluation of Nonpoint Silvicultural Sources (WRENSS), used in predicting the effects of timber harvesting on changes in water yield.
- Two preliminary reports were prepared for

the new Brazeau Timber Development Area.

- In conjunction with the University of Alberta, the Watershed Management Section undertook a soil erosion study in the Grande Prairie Forest. Initial results have proven useful in defining soils and erosion hazards.

The Recreation Section is involved in the operation and maintenance of existing recreation developments (see table 22) and construction of additional facilities according to priorities outlined in the report *AFS Recreation Program — Goals, Policies, Long-Range Objectives, Priorities and Budget Guidelines*. Priorities of the AFS Recreation Program over the next five years are the upgrading/expansion of existing facilities, trail development, designated overflow and random areas, group campgrounds, remote/primitive campgrounds, visitor information and auto-access campgrounds.

In 1981/82, a total of roughly \$1.13 million was spent on upgrading 16 recreation areas and new construction projects in five recreation areas, two group camps and two trails.

The role of the Alberta Forest Service in integrated management planning evolved significantly during 1981/82. AFS objectives for participating in the program were identified and a framework for divisional inputs developed. Data were collected for three major plans, Frost Hills, Nordegg-Red Deer and Rocky-North Saskatchewan. Comprehensive inputs for various phases in the planning process were also developed for 12 other plans. The Resource Planning Section coordinated the divisional input to the *Study of Helicopter Use in the Eastern Slopes Prime Protection Zone* as well as the divisional review of the Eastern Slopes Policy.

TIMBER MANAGEMENT BRANCH

The Timber Management Branch manages Alberta's timber resources to obtain an increased and perpetually-continuing timber harvest, while maintaining a forest environment of high quality. The branch allocates the timber resources of Alberta through timber supply analysis and harvest scheduling. It regulates, controls and inspects timber harvesting and production and scaling operations. It sells timber quotas, issues licences and permits, and collects timber dues, reforestation levies and holding and protection charges. It also compiles the provincial forest inventory.

In July, 1981 proposals were invited from individuals and companies to develop and fully utilize, on a sustained yield basis, the forest resource of the Brazeau Timber Development Area in west-central Alberta. The area of future development is divided into two blocks, Nordegg and O'Chiese. Nordegg

will produce an estimated sustained wood supply of 813 600 metres of softwood annually. O'Chiese will produce an estimated sustained wood supply of 292 300 cubic metres of softwood, and 398 100 cubic metres of hardwood annually.

In October, 1981, a Timber Salvage Incentive Program was announced. It is a program whereby commercial timber permit and timber licence operators harvesting timber recently killed or damaged by fire and insect attack are to be subsidized by \$34 per thousand fbm. It is estimated that approximately 225.56 million fbm of fire killed timber is available for salvage. To date, the timber industry has been able to salvage approximately 162 million fbm, and an additional 25 million fbm is anticipated to be salvaged.

A joint timber inventory and supply analysis project was initiated between Weldwood of Canada Limited and the AFS Timber Management Branch. The purpose of the project was to intensify the Phase 3 Forest Inventory in the Slave Lake area, to identify the poplar resource and analyze the supply of this resource. The project will provide timber supply information required in the renegotiation of a deciduous forest management area with Weldwood.

Work continued on the Phase 3 Forest Inventory of the province. This joint project, between Timber Management Branch and the Resource Evaluation Branch of the Resource Evaluation and Planning Division, will cover approximately 265 817 square kilometres (126 000 square miles) and has a target completion date of 1984.

Timber Management Branch has developed a timber supply analysis system to aid in determining and allocating the timber resources of the province. The system is in place and will be used to analyze timber supply for new and renewed quotas and agreements.

REFORESTATION AND RECLAMATION BRANCH

The Reforestation and Reclamation Branch is responsible for all reforestation and reclamation projects, the provincial forest genetics and tree improvement program, and the Pine Ridge Forest Nursery.

Reforestation surveys were completed on 18 245 hectares (45 051 acres) of cutover land, including 5 668 hectares (13 995 acres) of post-harvest surveys and 12 577 hectares (31 056 acres) of regeneration surveys. Of the area surveyed for regeneration, 77 per cent was found satisfactorily stocked according to existing provincial standards (see table 23).

Silviculture treatments completed by the Alber-

ta Forest Service included mechanical scarification of 5 964 hectares (14 726 acres), seeding of 3 127 hectares (7 721 acres), planting of 5 494 hectares (13 568 acres), and thinning of 251 hectares (621 acres). Cone collection totalled 3 864 hectolitres (10 626 bushels) for pine while no spruce cones were collected due to the very poor seed crop (see table 24).

The Maintaining Our Forests Afforestation Program, funded through the Alberta Heritage Savings Trust Fund, included: 57 437 hectares (141 820 acres) of stocking surveys, 11 785 hectares (29 099 acres) of land clearing, 5 153 hectares (12 723 acres) of scarification, 184 hectares (454 acres) of chemical release treatment, 1 604 hectares (4 049 acres) of planting (2 998 793 trees) and 149 hectares (368 acres) of thinning (see table 25).

During the year, the branch successfully undertook 61 operational reclamation projects covering approximately 155 kilometres (96 miles) of abandoned roads, trails and lines and approximately 25 hectares (62 acres) of other types of abandoned land disturbances such as sand and gravel pits, mill sites and well sites. The clean-up operation of the Brazeau Reservoir progressed, with work continuing on the removal, piling and burning of standing dead trees, snags and stumps. This work has further improved the recreational potential and scenic attraction of the reservoir.

A set of field trials to study the adaptability of selected native and exotic woody species on oil sands mine wastes was established. On-going studies include methods of minimizing erosion, seeding methods of native grasses, fertilization and species adaptability on abandoned land disturbances. Work on the collection of native woody species from the Eastern Slopes and studies of pre-treatment requirement for germination, and propagation methods continued. This project was in the initial stages of being extended to include the oil sands area as a joint government and industry effort.

The joint Alberta Forest Service/industry genetics and tree improvement program continued, with final agreements signed with British Columbia Forest Products Ltd., Canadian Forest Products Ltd. and Procter and Gamble Cellulose Ltd. As part of the co-operative tree breeding program, four lodgepole pine progeny test plantations were established and 23 superior white spruce trees were selected in northwestern Alberta.

Seven research plantations were established at various locations throughout the province, and site development and fencing of nine experimental areas was completed. A 30-hectare (74 acres) experimental area was developed and fenced, and irrigation was extended to provide for establish-

ment of a seed orchard and genetics research plantation at the Pine Ridge Forest Nursery. Stock from 27 tree species was raised for planting of a research arboretum. Thirty-one new seedlots were added to the genetics seed bank and 502 seedlots were germination-tested. Experimental planting stock production consisted of 9 704 seedlings and 535 grafts. Several studies on vegetation propagation, pollen handling and cultural techniques for plant propagation were continued or completed.

Funding through the Alberta Heritage Savings Trust Fund allowed for an expanded program in genetics and tree improvement during the year.

Expansion of the Pine Ridge Forest Nursery facilities to allow higher seedling production was started in the 1981/82 fiscal year. The first stage in this expansion was the construction of a new shade frame area to facilitate double cropping at the greenhouses.

The Research and Investigations Section continued to provide technical assistance in developing production techniques and procedures in the bareroot and container seedling production functions.

The Seed Program processed 6 056 hectolitres (13 904 bushels) of pine cones and only 3.3 hectolitres (9.1 bushels) of spruce cones in 1981/82. The total seed inventory was reduced by 4 964 kilograms (12 575 pounds) to 36 708 kilograms (98 340 pounds) (see table 26).

The Containerized Seedling Program continued, with an increase in production to 13 300 238 seedlings; 8 701 190 seedlings were shipped to reforestation sites for planting (see table 27).

The Bareroot Seedling Program continued to expand. An inventory of 18 010 000, 1-0 seedlings increased the overall inventory to 40 203 636 seedlings. A total of 9 007 410 bareroot seedlings were lifted and 6 187 503 were shipped for planting (see table 27).

FOREST RESEARCH BRANCH

The objectives of the Forest Research Branch are to initiate mission-oriented research by managing and supervising contract research and by conducting its own program in the field of improved forest land management; to transfer research results into practice; to provide an up-to-date review of relevant research carried out by other agencies; to assist in the development of government and industrial forest managers; and to coordinate research conducted in Alberta by other agencies such as the Canadian Forest Service, industry and universities.

It was planned that three research managers and necessary technical staff be recruited in the

current fiscal year. However, due to recruiting difficulties, only two research managers were hired on contract. As a result, research activities were restricted to contract research. A total of 14 projects was contracted out and eight projects were funded from the Forest Development Research Trust Fund.

PROGRAM SUPPORT BRANCH

This branch is composed of seven sections which provide support services in administration, budget and purchasing, building construction, equipment development, vehicle maintenance and extension services. The branch is also responsible for the Junior Forest Wardens and Junior Forest Rangers as well as special projects.

Through coordination by the Construction and Maintenance Section and Alberta Housing and Public Works, four of the six branches in the division moved into the Bramalea Building. Construction and Maintenance acted as space coordinator and liaison, with Alberta Housing and Public Works, for the Forest Protection Branch's computerized communications system.

Other projects resulting from joint efforts with Alberta Housing and Public Works include a new Whitecourt Forest headquarters, a new Grande Prairie Forest headquarters, helicopter fueling systems at Blairmore and Slave Lake and new office extensions at Footner Lake and Bow/Crow headquarters. Land has also been acquired for a new forest headquarters in Edson.

Office extensions in Edson, Athabasca, Rocky/Clearwater and Footner Lake Forest districts were completed. New ranger station buildings were built at Wandering River (Lac La Biche Forest) and Kinuso (Rocky/Clearwater Forest). Construction is underway on the Athabasca Forest/Fort McMurray ranger district office. Cone-drying sheds were constructed at the Footner Lake and Rocky/Clearwater headquarters sites.

Through its Edmonton shops, Construction and Maintenance provided millwork, cabinets and specialty items for all branches as required and the Sign Shop produced large numbers of high-quality signs for the forests, branches and Kananaskis Country.

The function of the Equipment Development Section is to design, develop and construct special forestry-related equipment and tools. Thus Reforestation and Reclamation Branch received a new aerial seeder to be used aboard a helicopter. This will enable greater accuracy and speed when seeding normally inaccessible terrain. Two seedling transport trailers were equipped with a new self-contained mist (water) spraying system.

The Mechanical Section provided maintenance for permanent and seasonal lease vehicles, heavy industrial tractors, construction equipment and other engine-powered units at numerous facilities located throughout the province. Alberta Forest Service transport trucks moved approximately 11 million seedlings to numerous planting sites around the province.

The Alberta Junior Forest Warden Program increased to 60 clubs with a total of 1 350 members. The continued promotion and recruitment of new clubs and leaders is expected to demonstrate a four-fold increase in membership by 1984. A recruitment program is underway to attract wardens in the 16-to-18-year-old group. A major expansion was made into Indian and Metis communities in the north.

More than 50 leadership workshops were conducted throughout the province ranging from outdoor learning and forestry education to planning and consultation.

The Junior Forest Warden Long Lake Camp, completed last year, has been certified by the Alberta Camp Association.

The Junior Forest Ranger Program, for boys and girls aged 16 to 18, made it possible for 120 young Albertans to live, learn and work in the forest area of Alberta during July and August. This program, originally funded by Advanced Education and Manpower, has been transferred to the Alberta Forest Service.

Minimum security camps were maintained jointly by the Department of Energy and Natural Resources and the Attorney General's Department. Inmates worked a total of 32 166 person/days on

forestry projects including recreation projects, mountain pine beetle control and fire suppression. Inmates also cut approximately 18 000 cubic metres (5 000 cords) of fuelwood for campsites.

The forestry career incentive program is educational work experience that provides an opportunity for Albertans to receive forestry training and academic upgrading in preparation to enter a forestry school program. The opportunity is given to individuals who would not normally have access to this type of career.

This fall, the first trainee from the career incentive program will enter the Northern Alberta Institute of Technology in Edmonton for further training. The program is still in its embryonic stage and is being closely monitored. At this time there are five in the program.

Co-operation between the Construction and Maintenance, Mechanical and Extension Services sections led to the completion of a major forestry display and a parade float. The display was used at the Calgary Stampede and Exhibition and Edmonton's Klondike Days as well as at the Alberta Natural Science Centre. The float was entered in parades around the province from July through September.

Other activities included a major publicity campaign about the mountain pine beetle, several mini display stems and coordination of the official opening of the Slave Lake Forest Headquarters.

A total of 262 047 cubic metres (342 745 cubic yards) of gravel and 48 465 cubic metres (63 390 cubic yards) of sand were extracted at the Poplar Creek gravel pit during the 1981/82 fiscal year. Revenues after expenditures were \$184 929.

Resource Evaluation and Planning Division

Report of the Executive Director
L.J. COOKE

The Resource Evaluation and Planning Division provides a complete range of aerial photography, resource mapping, resource inventory and appraisal, integrated resource policy and planning and intra- and interdepartmental coordination services to the Department. The functions and responsibilities of the division are carried out by the Resource Evaluation, Resource Planning and Program Support Branches and regional resource coordinators located in each regional headquarters. As of March 31, 1981, the division's staff establishment was 148 permanent positions.

RESOURCE EVALUATION BRANCH

The Resource Evaluation Branch includes three major responsibility areas: Resource Mapping, Resource Inventory and Appraisal and the Natural Resources Information System. The branch provides comprehensive services related to aerial photography, field survey information, photogrammetric and cartographic services, map and air-photo reproduction, inventory and appraisal of natural resources, and the development of an overall natural resources information system for public land and resources.

The demand for the photogrammetric and cartographic services provided by Resource Mapping continued to increase in 1981/82. In addition to the regular series mapping projects (see map groups 2 and 3), cartography and printing were completed for the revision of the 1:100 000 and 1:500 000 Provincial Base Mapping Series, the update of the Public Lands Classification Map, two revisions of the Kananaskis Country Map, the revision of four Fish and Wildlife Regulatory Maps and 169 other graphic projects. A total of 60 178 km² were mapped for the Alberta Forest Inventory Mapping Program.

Photogrammetric Services experienced a significant increase in production (see table 19), even though record forest fires prevented the completion of several projects. Progress was made in meeting the needs of several major resource mapping projects including the Alberta Forest Inventory Mapping Program and the recently-initiated 1:20 000 Provincial Series. Orthophoto map production continued at a high volume through provincial contractors. An analytic stereoplotter, acquired this year, will greatly enhance photogrammetric interpretation when it is interfaced with the Computer Graphics Mapping System.

Demand for the services of the Map and Air Photo Reproduction Centre increased (see table 20), particularly in the areas of diapositive printing, ltek printing and graphics reproduction, and mainly because of the Alberta Forest Inventory Project. Prog-

ress continued toward improving quality control through the enhancement of sensitometric procedures.

Resource Inventory and Appraisal provides baseline inventory data for various natural resources and appraises the utility of these resources for provincial resource management and planning agencies. There are four functional sections: Land Classification, Resource Inventory, Resource Appraisal and Inventory Development; each is responsible for a component of the overall resource inventory and appraisal program. Additionally, the Alberta Research Council has been contracted to undertake certain resource evaluation activities on behalf of the Department.

The Land Classification Section completed physical land classification studies for the Swan Hills Townsite, the Frost Hills, Rocky-North Saskatchewan, Jean D'Or Prairie and Linton Lake areas and a number of grazing leases in the Peace River Region. Classification is on-going for Swan Hills, B-6 Management Unit, Chungo-Cline-Nordegg, Ram-Clearwater, Deep Basin and Lakeland Operational Management areas and the Clearwater River Watershed. Terrain sensitivity has been completed for the W4 Management Unit of the Whitecourt Forest with work in progress for several sites in the Grande Prairie Forest (see map group 4).

The Resource Inventory Section gathers a wide variety of biological inventory data. The Forest Inventory Unit completed 68 842 square kilometres of Alberta Forest Inventory Interpretation at a scale of 1:15 000. The total area completed represents approximately 90 per cent of the Alberta Forest Inventory program area (see map 5).

The Forest Site Classification Unit, in conjunction with the Forest Research Branch of the Alberta Forest Service and Canadian Forest Products Limited, continued the Biogeoclimatic Forest Site Classification Program. Field work was concentrated in the Grande Prairie area with data analysis contributing to the reports *Biogeoclimatic Zones of Alberta* and *Field Guides for Forest Management*.

The Forage Inventory Unit undertook field work in the Frost Hills, Chungo-Cline-Nordegg and Ram-Clearwater areas. Field work, data analysis, mapping and report writing resulted in the completion of comprehensive vegetation information for the three study areas (see map group 4).

The Resource Appraisal Section continued its program of providing Ecological Land Surveys for the integrated resource planning process and for other resource development planning areas. The publication *Ecoregions of Alberta* has undergone second printing due to high demand. Ecological Land Classification reports were completed for the

Frost Hills, Jean D'Or, Red Deer-James and Rocky-North Saskatchewan areas. Reports for Kananaskis Country and the Sturgeon-Lake-Puskwaskau area are nearing completion. Work is currently focused on the Chungo-Cline-Nordegg, Ram-Clearwater and Wapiti study areas. Also nearing completion is an extended investigation of skiing potential in the Eastern Slopes region (see map 6).

The Climate Inventory program operated two year-round agroclimatic networks in the Green-Yellow area fringe of the Peace River Region: High Level-Fort Vermilion and the Sturgeon-Lesser Slave Lake areas (see map group 4). Another network was operated in co-operation with the Fish and Wildlife Division to monitor the winter climate of a number of caribou habitat sites in the Muskeg River area north of Hinton. Winter climate was also monitored for a downhill ski area evaluation. A computer-based climate data management system is being developed and should be completed by the end of the next fiscal year. Climate summaries and evaluations were supplied for a number of ecological and physical land surveys. The climate program continued to coordinate its activities with other branches within Alberta Energy and Natural Resources, as well as with the federal government and universities.

The Inventory Development Section assumed responsibility for the production of the *Natural Resources Information Directory*. The 1982 edition of this document was greatly expanded and the information was presented in a new, more orderly format. The section also continued the investigation of inventory procedures and technology for the development of new information projects and the enhancement of existing projects and methods.

The Resource Inventory and Appraisal program also includes three major projects which have been contracted to the Alberta Research Council. The Coal Evaluation Program is continuing the interpretation and evaluation of inventory data gathered by the program since 1974. During 1981, work continued on coal deposits in the Horseshoe Canyon Formation and a report was completed on the Carbon and Thompson coal deposits in Central Alberta. The Provincial Sand and Gravel Inventory is continuing, with reports published and distributed in 1981/82 for the Medicine Hat and Vegreville areas (a total of 15 1:50 000 map sheets). The clays of these areas were also studied for potential as materials from which to make expanded aggregate. The Athabasca Oil Sands Groundwater Observation program was turned over to the Alberta Research Council in March, 1982 and subsequently transferred to Alberta Environment.

The Resource Evaluation Branch acquired auto-

mated graphics equipment for the Computer Graphics Mapping System. This system will enhance map storage and manipulation capabilities in support of resource inventory, management and planning activities. Acquisition of this system is a major step toward the creation of a complete Natural Resources Information System to provide more readily-available, current natural resource information.

RESOURCE PLANNING BRANCH

The Resource Planning Branch coordinates the preparation of integrated natural resource plans in order to optimize use of public lands and resources in Alberta. Within the branch, the Regional Planning Section provides comprehensive regional plans that reflect Alberta natural resource policies and provide a framework for the development of integrated resource plans. The Management Planning Section prepares the more detailed integrated resource plans for specific areas in Alberta. These plans provide guidelines for resource management and indicate which uses should take place and specifically where and under what conditions they should occur. The Current Planning Section provides a short-term integrated planning service to resource managers using existing information. The service is restricted to problem situations which, due to high priority or degree of conflict, cannot await the longer term required for the preparation of a standard integrated resource plan.

The Resource Planning Branch also provides review and referral services by coordinating departmental comments on a wide range of matters, including all referrals to the Department from other departments and agencies, preliminary disclosures for coal development proposals and major development proposals in the Eastern Slopes, applications for rezoning under the Eastern Slopes Policy and applications for reclassification under the Alberta Coal Development Policy. In 1981/82, 61 referrals of all types were coordinated by the Current Planning Section, including 12 major development proposals related to the Eastern Slopes and Coal Development policies.

As its primary responsibility, the Resource Planning Branch provides coordination and direction for integrated resource planning for the regional, management and current plans. During 1981/82 the branch was coordinating 16 planning projects including two regional level plans, 11 management plans, two grazing reserves plans and one current plan (see map 7). A grazing reserve plan for the Sang Lake area was completed. The administrative review of *A Policy for Resource Management of the*

Eastern Slopes continued under the direction of the interdepartmental resource integration committee. The Resource Planning Branch was also involved in the study of a number of policy issues related to the potential for agricultural expansion on public lands, helicopter use in the Eastern Slopes and surface minerals policy.

The branch has continued to ensure that the planning services provided are meeting the needs of the departments involved in integrated resource planning. With the interdepartmental resource integration committee, the branch continued to clarify and update the system used to implement the concept of integrated resource planning for public lands and resources in Alberta, with particular attention being directed to incorporating regionalization.

The involvement of many public groups and individuals has increased significantly through 1981/82 on all planning and policy projects. To respond effectively to this, branch staff resources have been reallocated to form the Public Involvement Program Section. In addition, the advisory committee to the Associate Minister successfully completed its first year of operation, providing the government with recommendations on a wide

range of integrated resource policy matters.

New activities in 1981/82 include a sub-regional plan for the Nordegg-Red Deer River area in the Eastern Slopes, and an analysis of issues and concerns in the Peace River Region to assist the regional directors in establishing planning priorities.

The branch continued to provide service and chairmanship for the resource integration committee and staff to participate on a number of committees. Increased understanding and commitment by all the agencies and public groups involved in integrated resource planning progressed well in 1981/82. In the following years this will result in the completion and effective implementation of plans that will help optimize resource benefits to Albertans.

PROGRAM SUPPORT

In 1981/82, regional coordination services were initiated with regional resource coordinators being placed in the Department's regional headquarters in Peace River, St. Paul, Rocky Mountain House and Lethbridge. The coordinators will be assisting the department's senior field managers in the implementation of integrated resource planning and management.

Public Lands Division

Report of the Assistant Deputy Minister
L.M. FORBES

The Public Lands Division is responsible for the administration of public lands as defined in the Public Lands Act.

Public lands are leased for grazing, cultivation and recreational, commercial and industrial uses, including those surface leases related to the oil and gas extraction industry. Suitable lands may be sold for certain specified purposes such as farms, subdivisions, plant sites, etc. Public lands are used for the establishment of grazing reserves, which are tracts of land developed by the division for livestock grazing.

The division is responsible for detailed classification of land to determine its suitability for various purposes. Public lands may be reserved for the use of other departments and agencies, and land use restrictions are placed on certain public lands, limiting their use to specified purposes.

In order to provide a greater regional perspective with respect to the management of public lands, field staff have been assigned to five of the department's regions: Peace River, North East, Eastern Slopes/Central and the Southern. The regional boundaries coincide with those of the other renewable resource divisions of the Department.

The Public Lands Division's staff consists of 296 permanent employees and comprises three branches: Program Support, Public Land Dispositions and Land Management and Development.

PROGRAM SUPPORT BRANCH

The Program Support Branch is responsible for field services and administrative support for the division and documentation services for Renewable Resources.

Land inventory work was carried out on a total of 42 525 hectares (105 000 acres) in areas northeast of High Level, north of Fort Vermilion, east of Tompkins Landing, in the Carcajou area, west of Keg River, northwest and northeast of Peace River, southwest of Grande Prairie as well as in other smaller areas scattered throughout the Peace River region.

During the year, 1 821 quarter sections were posted for agricultural disposition. This included land for new settlement south of Valleyview, northwest of Hythe and in the immediate area of Cleardale. In areas of new settlement, most of the lands were posted in units of two to four quarter sections in order to provide potentially viable units to existing or new settlers.

Eighty-five grazing associations and co-operatives hold in excess of 405 000 hectares (one million acres) of public land under grazing lease or grazing permit. The branch is assisting these com-

munity pasture associations to achieve a fairer allocation of grazing privileges through a systematic review of their governing bylaws. Approximately 17 of these associations and co-operatives have so far submitted updated bylaws.

There were no new field offices established during the year.

PUBLIC LAND DISPOSITIONS BRANCH

The Public Land Dispositions Branch is responsible for issuing and administering dispositions on public land for grazing, agricultural, commercial, industrial, residential, recreational and sand and gravel extraction purposes. Dispositions include sales, leases, licences, easements, permits and agreements.

The number of grazing lease applications received dropped by 15 per cent in 1981/82 in comparison with the previous fiscal year.

Grazing conditions were favorable throughout most of the province in 1981. The royalty percentages of forage value used to establish grazing lease rentals remained unchanged at 10 per cent for the southern district, 8.3 per cent for the central district and five per cent for the northern district. The average weight gain figure used in setting annual grazing rentals was increased from 250 to 300 pounds per animal unit, as data for livestock weight gains on grass indicated that 300 pounds was a more realistic figure. The 250-pound figure had not been adjusted since it was first established in 1945. The increase in the weight gain figure, combined with a decrease of 8.8 per cent in the price of beef, resulted in an overall average increase of 9.5 per cent in the grazing rental charges throughout the province.

Demand for agricultural dispositions on public land continues to exceed the amount of land available. A significantly greater amount of land is being disposed of under the Farm Development, Consolidation and Enlargement Regulations than by homestead sale. The issuance of farm development leases with options to purchase has proven quite effective in getting development started during the early years. The leases are frequently recommended by agricultural development committees.

Industrial activity related to the oil and gas industry was down substantially from previous years. For example, mineral surface lease applications, which is the disposition for which the branch receives most applications, were down by 26 per cent in 1981/82.

The Licence of Occupation Regulation, 1981 was passed. This is a complete rewrite of the former regulation. The major changes are as follows; licences must now be issued for a specific term

(under the former regulation they were indefinite); the application fee for commercial users was increased from \$10 to \$25; the application fee for non-profit organizations was eliminated. The elimination of an application fee creates a precedent for the branch.

Interest in seeding and harvesting wild rice is increasing. The branch received nine applications to seed 17 lakes in northeastern Alberta. It appears wild rice production may be a viable enterprise, judging from the interest that has been expressed to date.

LAND MANAGEMENT AND DEVELOPMENT BRANCH

The Land Management and Development Branch is responsible for operational level planning and development and for providing the standards of land use in order that land use decisions are in keeping with the primary or multiple-use concept.

During the 1981/82 season, under the 100 per cent government-funded Range Improvement Program, 154 individual applications and four grazing association applications for range improvement were approved. The work carried out included clearing, piling, trail and cross-fence line clearing, fence construction, seeding to forage and water storage projects.

In the past year, activities of the central Alberta range management unit continued to concentrate on applied range research, inventory and management planning. On-going research focused on the information needs for range management and improvement on public lands and included projects that dealt with prescribed burning, rotational grazing, forage establishment and woody regrowth control. In a supportive role to the grazing reserves and range improvement programs, range inventories and management-development proposals were completed for the Minburn, Rannach, Lucky Lakes, Beaverhill Lake and Peace River Slopes study areas.

In southern Alberta, range management staff continued with developmental research projects

such as varietal trial plots, vegetative response to Tordon, forage utilization and productivity, remote sensing research and effect of fire on grazing lands.

In the spring of 1981, the Timber Ridge Integrated Resource Management Plan was initiated. Timber Ridge is located just east of Chain Lakes Provincial Park.

Initial utilization of the Bear Canyon, Blueberry Mountain, Fort Vermilion and High Prairie Provincial Grazing Reserves took place in the 1981 grazing season. The livestock producers looked after their own livestock as the Department did not have pasture managers on staff for the 1981 season. Development work continued on various reserves including the Hays Irrigated Grazing Reserve, which is to be used for sheep producers of southern Alberta.

The range conditions throughout the 1981 year were quite favorable and good livestock gains were obtained at all reserves.

In a co-operative effort with Alberta Recreation and Parks, amendments were made to the Wilderness Areas Act to enable the establishment and management of ecological reserves. Candidate areas have been selected and are proposed to become reserves through Order-in-Council. Additionally, a number of proposed natural areas were added to the existing inventory for recreational and educational purposes.

Fourteen reclamation projects were completed in a continuing program involving regular budget and Alberta Heritage Savings and Trust Fund monies. This program is part of an overall program of public land management with the goal of reclaiming surface disturbances on public lands in settled areas, where parties responsible for the disturbance cannot be determined, or for erosion control work.

Contracts were prepared and issued to a private consulting firm to conduct a detailed arable land inventory of 659 quarter sections (105 440 acres) as part of the Department's accelerated land sale initiative. The work was completed and reports have been received. Posting of suitable lands is expected in 1982. Sixteen industrial lots were surveyed at Conklin, Alberta.

Fish and Wildlife

Report of the Assistant Deputy Minister
D.C. SURRENDI

The Fish and Wildlife Division manages the fish and wildlife resources of the province to obtain the greatest benefit and enjoyment for all Albertans. In doing this, the division is closely allied with private groups and other government agencies. Coincident with these programs has been the preparation and formalizing of specific policy guidelines pursuant to fish and wildlife resources and the roles and responsibilities of the division and its staff to meet this mandate. These policy statements have been delivered to the Minister for review and endorsement by the government.

Foremost in the past year's achievements and effective in March, 1982, have been: a further reorganization of the headquarters staff in Edmonton to involve an executive director of operations who implements policy, programs, and procedures in all operational matters pertaining to resource programs at the regional level, ensuring consistent operational standards within central branch program and policy guidelines.

The Administration Services Branch was formed to include the licensing program, financial administration, budget coordination, vehicles, warehousing, policy, program, coordination and evaluation of administration and financial guidelines.

A Wildlife Branch now encompasses all matters of wildlife with a focus on all policy and program development and evaluation for wildlife programs on a provincial basis. This branch assumes responsibility for all fur management programs including trapper compensation. In addition, all provincial wildlife management priorities, habitat programs, planning, research and the development of provincial wildlife management plans are now the responsibility of this branch.

The Fisheries Branch is accountable for all policy and program development and evaluation for fisheries matters on a provincial basis. These activities include fisheries habitat, management priorities and planning, investigations, stocking priorities and contributions to all operational policy relating to fisheries.

The Ecological Assessments Branch represents the division's interests on all referral systems and ecological assessments. This branch assumes a one-window focus on the division for assessment of land use and/or resource management referrals and represents divisional interests in the provision of land use conditions that recognize the interests of fish and wildlife resources. Other activities include land use guidelines, evaluation of industrial developments and special guidelines pertinent to the division in land use planning and coordination of inter-regional planning.

The Public Information and Extension Branch was established to handle divisional public information and extension services to ensure consistent application of departmental and government policy in the preparation of materials for public use and to ensure a high level of public awareness and understanding of the division's management programs. The conservation education program will work more closely with resource education elements of the division to bring these programs closer to the youth of the province. A public inquiries unit will enhance the division's capabilities to provide public access to the division through the telephone or in person.

Operations Branch includes all regional services and is responsible for the development, implementation and management of the division's programs on a regional basis. Incorporated in this unit is the office of the executive director of operations and the chief of enforcement and field services. In addition to the formulation of all regional programs, this branch is responsible for the development of enforcement strategy, field service programs involving nuisance wildlife control, the application, interpretation and administration of Fish and Wildlife resource legislation, and the management of regulatory activities. The branch will ensure maximum public benefit through the formation of measurable objectives for all regional programs and the allocation of appropriate budget and staff requirements.

The five regional directors implement all divisional operations on a regional basis through the effective management of financial and manpower resources to ensure a high level of public service and benefits.

A new unit called Program Evaluation and Resource Economics will provide advice and assistance regarding the design and evaluation of programs, and research techniques necessary to support the delivery of these programs. This unit is also responsible for socio-economic research to determine the value Albertans place on fish and wildlife resources. This information will be used to develop priorities in the initiation, scope and delivery of divisional programs. As required, the value of fish and wildlife will be examined in recreational and commercial terms.

Concurrent with this reorganization, the following activities highlight the past year:

- Combined efforts by Conservation Hunter Education and Enforcement staff resulted in a successful and rewarding shooting program for more than 4 000 Boy Scouts at the Canadian Scout Jamboree CJ-81 in Bow Valley Provincial Park.

- A committee involving selected members of the public was formed to simplify hunting regulations.
- The Trapper Compensation Review Board was expanded from three members to six representing Indians, Metis and the petroleum industry.
- An action plan was begun to formulate a policy and response team approach to deal with bear incidents throughout the province.

The permanent staff count of the division as of March 31, 1982, was 414.

ADMINISTRATION SERVICES

In March of 1982 the Administration Services Branch and the Public Information and Extension Branch were created through the reorganization of the Program Support Branch.

The Administration Services Branch will concentrate on the development of the policy procedures and guidelines and the evaluation of the effectiveness of the overall administration of the Fish and Wildlife Division. It will continue to coordinate the development of the divisional budget and ensure that financial management of the division meets the requirements of the Financial Administration Act.

Applicants for hunting authorizations increased to 104 323, an increase of 10.6 per cent from 1980/81, with more than 26 000 authorization and special licences being issued.

In addition, staff participated in numerous committees and training sessions inherent in the new regionalization aspects of the Department. Involvement continued with the Interdepartmental and Departmental Committee on Boating Regulations, Guiding and Outfitting Areas Committee, the Advisory Council of the division, and the Lands Status Automated System Committee.

With continuous reorganization, the Administration Services Section was instrumental in coordinating the shift of budget allocations and the corresponding transfer of people and positions to meet the regional commitments of the Fish and Wildlife Division.

PUBLIC INFORMATION AND EXTENSION BRANCH

The Public Information and Extension Branch is the principal unit to promote to the public the interests of the Fish and Wildlife Division through the preparation and delivery of a variety of information and educational materials.

Foremost this year was the completion of the 255-page *Alberta Conservation and Hunter Education* manual and the beginning of a major recerti-

fication program for volunteer instructors. More than 60 recertification workshops were held to bring 928 instructors up-to-date with the new manual. Coincident with this program was the hosting of the North American Association of Hunter Safety Coordinators professional staff development academy in Alberta.

Major support was given by staff to the Boy Scouts of Canada at their 1981 Jamboree where more than 4 000 scouts were instructed in firearm safety, trapshooting and small bore .22 rifle shooting. Assistance in a similar but reduced fashion was given to the Alberta Fish and Game Association.

Throughout 1981 more than 10 000 Albertans participated in the Conservation Hunter Education program. Of these, more than half took the course through the junior high school curriculum. Approximately 4 300 participated in the camp programs.

Staff continued to deliver talks and participate in panels highlighting divisional programs such as the Brooks Wildlife Centre, Sam Livingstone Fish Hatchery and Kananaskis Country.

In Kananaskis Country, divisional messages were incorporated into the programs of other government agencies. Progress was made to entrench delivery systems for divisional materials at strategic information centres and campgrounds.

Within the resource education unit, a senior staff member was seconded to the Canadian Wildlife Federation (CWF) in Ottawa. This arrangement will allow the CWF to expand its national program of preparing and delivering conservation messages across the country.

Revisions of three wildlife brochures were completed. A brochure on *Bear Facts* was completely revamped with new artwork and text. Brochures on fishing and birds in Kananaskis Country were completed.

A major promotion was Wildlife Week. Albertans from a variety of walks of life participated in this important event. The school systems received prime attention with more than 20 000 students receiving information kits. Alberta students received top honors in the national poster contest.

A new research officer was recruited to expand studies on the value of Alberta's fish and wildlife resources. Special attention was devoted to Alberta's share in a national survey on the socio-economic value of wildlife.

Assistance was provided to all staff involving sophisticated statistical designs for their projects with emphasis on deciphering results and presenting meaningful information to the public.

In 1981, more than 400 hunters who lost their licences were required to take the hunter test before they could regain their hunting privileges. A formal

procedure of testing incorporates four exams including a practical portion.

ENFORCEMENT AND FIELD SERVICES BRANCH

Fish and Wildlife Enforcement Officers throughout the province continued to provide a variety of field services to the public. The officers' primary activities included the enforcement of resource-related legislation, response to citizen complaints, problem wildlife control work, conducting investigations and public education.

New district offices were opened at Spirit River, Fox Creek and Lloydminster, enabling greater extension of public services. In addition to staff realignment, an office was also opened at Drayton Valley. In conjunction with this, four new officer positions were obtained in the last budget.

Major changes during the 1981/82 fiscal year resulted in the transfer of line authorities from headquarters to the regional directors. Headquarters staff is now responsible for the policy and standards formulation and the monitoring and assessment of field services programs. The regions will be responsible for the operation and implementation of these programs.

Through 55 district offices, staff dealt with 20 660 occurrences, 9 754 investigations, 2 562 warnings and 4 247 prosecutions. There was an increase in occurrences of 3.88 per cent. A total of 33.63 per cent of occurrences related to nuisance wildlife matters, 522 ungulates, 3 039 beaver, 1 350 bear, 162 wolves, and 1 877 miscellaneous (see table 37).

Illegal activities accounted for 31.37 per cent of the occurrences during this past season. The Found Dead Wildlife Program, which allows the public to make application to retain found specimens, showed a 105.3 per cent increase in applications in its second year (1 166 applications). Raptors, particularly owls, are the most common species found and applied for. Tables 37 to 41 summarize the Fish and Wildlife Division's enforcement activities for the 1981/82 fiscal year. The data included consists of all cases handled during the year which have been concluded by the courts and processed as of June 1, 1982. A total of 3 687 cases have been finalized by the division with an additional 560 cases being processed for conversion and an unknown number pending court disposition. The total caseload is comparable to previous fiscal years' activities.

The division's conviction caseload consisted mostly of Fisheries Regulation violations (1 039 cases with an average fine of \$44.97) and Wildlife Act violations (951 cases with an average fine of \$104.77). The largest fines were assessed to big

game violations (\$205.26 - see table 40) with the other conviction types reporting between \$45 and \$67. The total fine revenue for concluded cases processed amounted to \$231 013, with an average of \$67.14.

During 1981/82, major changes were introduced to the reporting procedures for the prosecution report system, are scheduled for implementation April 1, 1982. These changes will expedite conversion of prosecution data immediately following case initiation. This will enable documentation of pending cases, thereby providing more current caseload information at fiscal year-end.

The Enforcement Section continued its participation in the Boat Safety Check Program during 1981. The program, which involves participation with different agencies, is designed to educate recreational boat users on boating safety to minimize water-related accidents, ensure adequate and proper equipment and promote safe boating practices. This year, the administration of the program was greatly enhanced with the implementation of a computerized information system documenting all vessel contacts. The automated system introduced in the 1981 patrol season is designed to replace various manual reporting procedures and provide more detailed patrol contact information, assisting in evaluation of program effectiveness.

Division staff responded to 6 950 problem wildlife complaints in 1981/82. Grants from the Alberta Agriculture Service Board to municipalities to respond to beaver complaints remained at a maximum of \$8 000 which, together with division participation, resulted in more than \$345 000 being spent on beaver flood control. Perforated culverts were again available at no cost to municipal districts to control water level in beaver ponds. This project was partly funded by Buck for Wildlife. The stream bed reclamation project on the Parley Creek was supervised by Fish and Wildlife, using penitentiary labor.

Complaints about bears were low in the spring and summer and increased towards fall resulting in a reduction of beeyard, livestock and campground complaints. Wolf complaints were down slightly (nine per cent) over 1980/81.

The winter of 81/82 was long, cold and in most areas, there was more snow than usual. Antelope and deer complaints were identical to the previous year with a 12 per cent increase in elk complaints. Moose showed an increase of 40 per cent due to heavy prolonged snow in the forest areas. The ungulate fencing program received high priority with 61 600 feet of watchman wire fencing made available for elk and 30 000 feet of snow fencing for deer problems. Specialists conducted a study on radio-

collared elk to determine the effect of electronic stack protectors to stop repeated visits to feed-stacks.

The Forensic Science Research staff was involved in identifying meat samples for approximately 80 court cases. Forensic assistance was requested and provided to other agencies and provinces (i.e. Manitoba, B.C., etc.). Efforts are continuing to develop a capability to identify meat samples of all mammals and birds in Alberta through forensic methods. Experiments were initiated on a study to determine whether trace elements can be used to identify wildlife from geographical location.

Enforcement-related research continued during 1981/82, primarily focusing upon the analysis of district workloads to provide criteria for effective staff planning and deployment. To facilitate this, work has begun on an automated information system designed to provide detailed documentation of officer response to public complaints of illegal resource use activity, problem wildlife and environmental damage. The Animal Incident Documentation System will assist in more effectively monitoring public demand on officer time, and in providing information for management decisions on staff placement. The development, initiated in December 1981, is scheduled for implementation early in the 1982/83 fiscal year.

The Special Investigation Section has expanded in capability to undertake covert and plain-clothes operations. Continued reorganization has shifted several administrative responsibilities to other sections providing more time to be spent in the area of illegal commercialization of wildlife. An increase in available funds and the approval for a rotating Officer I position assigned to the unit will provide a greater degree of effectiveness over the next fiscal year.

FISHERIES MANAGEMENT BRANCH

The Fisheries Management Branch manages the fish resources and aquatic ecosystems of Alberta. This branch is responsible for research into, and planning for, the perpetuation of fish resources in order to provide enjoyment of this renewable resource for Albertans.

Main objectives are:

- Maintaining and enhancing fish population levels to provide the opportunity for recreational fishing, commercial fishing, domestic use, scientific and educational uses.
- Ensuring the maintenance of the capability of surface waters in Alberta to meet the needs identified in the first objective.
- Informing and educating the public on the

conservation and management of aquatic resources.

Fisheries Management Branch consists of four sections: the Fisheries Management Section, Fisheries Research Section, Fish Culture Section and, added this year, Fisheries Habitat Inventory and Development Section. As well, commercial fisheries and aquaculture needs are met by staff specialists assigned to these fields.

In 1981/82, the fisheries management program saw continued activity in checking and surveying 250 lakes and streams for winterkill, effectiveness of stocking and water quality, the results of which were used to modify the fish stocking program and the angling regulations. A total of 234 lakes and streams were stocked, mainly with trout, but also small numbers of yellow perch and pike. The numbers of each species and the provincial distribution of these fish are shown in tables 42 and 43. One lake was treated with chemical to remove all the coarse fish and restocked with trout. The fish stocking program is designed to provide a variety of fish species for the enjoyment of anglers.

The Walleye Enhancement Program was directed at funding and evaluating natural walleye egg supplies to be used for future walleye stocking programs. Six natural spawning runs, located in various parts of the province, were identified as potential runs for producing walleye eggs.

A new program of fisheries public access development was initiated in 1981/82. This program is directed at providing public access facilities at lakes and streams. The facilities will be very basic and will include boat launching ramps and gravelled parking areas, with garbage and sanitary maintenance. This program is being developed in co-operation with other provincial agencies and county governments.

The survey of angler activities for 1980 was completed and the result compared with a similar survey done for 1975. There were 214 266 angling licences sold in 1975 and 295 772 in 1980, a 38 per cent increase. In 1975, anglers spent, on the average, 11.5 days per year angling and in 1980 they spent 17.6 days angling. They caught and kept 4 557 889 fish in 1975 and 10 573 441 fish in 1980. They reported spending a total of \$105 million dollars in 1975 and \$232 million in 1980 on sport fishing.

The fisheries management staff attended a number of meetings with commercial fishermen to set fishing seasons and quotas. There were 86 lakes commercially fished producing 2 128 tonnes (2 345 tons) of fish with a market value of \$3 172 156. This is down slightly from the 1980/81 market value of \$3 326 324 (see table 44).

In addition to liaison with commercial fisher-

men, the division also maintained frequent contact with the Freshwater Fish Marketing Corporation and the Fish Inspection Branch of Environment Canada.

The Fisheries Research Section completed data collections, analysis and reports on stocking rates for pothole lake rainbow trout fisheries, and forecasted growth rates of lake whitefish populations. Emphasis was placed on the development of techniques and construction of equipment to be employed in the walleye enhancement program.

Spring spawning migrations of walleye into Buffalo Bay (Lesser Slave Lake) were intercepted, tagged and released. Walleye tagged in previous years and recaptured were tabulated and released. The locations of capture of marked walleye by anglers and in commercial nets were documented throughout the year.

Nine million walleye eggs were obtained from walleyes captured in the Sand River and Winefred Lake. They were transported to the Sam Livingston Fish Hatchery in Calgary for incubation and hatching. Laboratory experiments on the incubation and hatching of walleye eggs revealed that egg incubation water temperature was critical for survival of walleye populations in Alberta. This information is important to the development of a walleye hatchery in the province.

The Lac La Biche and Calgary regions were surveyed for borrow pits and potholes suitable for rearing walleye in the spring, and harvest of walleye in the early summer for stocking selected Alberta lakes. Twenty adult walleye traps were constructed to be used in the spring of 1982 to capture walleye for spawning. Walleye traps for capturing fingerlings were constructed to recapture stocked walleye from potholes and borrow pits for transport to and stocking in selected lakes in 1982.

The Fish Culture Section reports that trout production in 1981 was 49 089 kg (108 223 lbs.), which slightly exceeded the 1980 record of 48 500 kg. Trout eggs for the hatchery were not as readily available from outside sources as was hoped and the quality was not consistent. Three and one-third million rainbow eggs were purchased and hatched along with 1.3 million rainbow trout fry and 210 701 brook trout from the province's Raven Station stocks. This was a substantial improvement from 1980 and resulted in planting of 3 809 080 trout. Total fish stocked in 1981 amounted to 4 184 591.

Other developments in fish culture during the year under review include the following:

- Wild brown trout eggs were collected for future Allison Brood Station, Crowsnest Pass, broodstock.
- Brook trout were retained for future brood

stocks in Allison Brood Station and select rainbow trout stocks were retained for genetic improvement of rainbow trout.

- Major construction is underway at Allison Brood Station. Completion is scheduled for mid-1982.
- From trout eggs collected at Cornwall Lake 238 306 lake trout fingerlings were provided for stocking.
- From trout eggs collected at Job (Wilson) Lake 58 670 cutthroat trout fingerlings were planted.
- A small excess of brown trout was available from the brood stock collection and 4 560 were planted.
- Approximately 9 600 smallmouth bass fry were successfully planted in Island Lake.
- Feasibility studies continue in an effort to locate suitable sites for a northern fish hatchery for walleye and trout as well as two trout-rearing stations.

In aquaculture, 1981 appears to have been a successful year. Game fish farmers had better access to trout supplies than in any recent year and licence sales were correspondingly higher, registering more than 1 700 licences sold in comparison with fewer than 1 600 in the previous year. Complaints about summerkill were average to below average.

Sundance Aquafarms advised that the firm would not be operating in 1982. Sundance had enjoyed a moderately successful production year raising fingerlings for pothole sales in the 1980/81 season.

A new initiative in aquaculture involved the development of a small pilot project to assess the feasibility of rearing native crayfish for food. The project utilizes a number of small pothole-type bodies of water. This crayfish assessment is expected to extend through 1982.

The Fisheries Habitat Inventory and Development Section became part of the Fisheries Branch at fiscal year end. It was formerly one of three sections in the Habitat Protection and Management Branch. Considerable progress has been made in determining current and potential fisheries habitat capability as well as determining fisheries objectives based on supply and demand criteria into land use objectives for planning programs.

The 1981/82 development work included continuation of the Buck for Wildlife program. Buck for Wildlife Fisheries Projects, their status and expenditures are shown in table 45. This has resulted in a carryover and rescheduling of projects in 1982/83. Although progress continued to be made with the streambank fencing project, increased emphasis

was placed on reservoir maintenance and development. Increased emphasis is also being placed on public participation in the program.

The Inventory Unit became functional towards the end of 1981. Work was begun on development of a habitat inventory program plan. Work focused on defining immediate program objectives, initial development of a data storage and retrieval system, initiation of a search and cataloguing of existing divisional fisheries information, and an acceleration of the 1:50 000 series of mylar maps showing fish resource information.

ECOLOGICAL ASSESSMENTS BRANCH

Reorganization and regionalization within the newly-created Habitat Branch occurred during 1981/82 with the creation of an Ecological Assessment Branch. This branch is responsible for the integration of fish and wildlife management with other resource management activities throughout Alberta.

The branch assesses industrial activities to minimize impacts by protecting as well as enhancing fish and wildlife populations and their habitats. It is also responsible for ensuring that government legislation and policies affecting land and water development incorporate provisions for the conservation and protection of fish and wildlife resources. This includes involvement in the planning with other land and water management agencies at the Departmental, inter-Departmental and municipal level through the provision of both habitat and population information.

Because of regionalization, and because regional boundaries were made common for all divisions of the Department, the referral processes have now been integrated into the regions.

Four wildlife habitat guidelines were completed. They explain mitigation in land use activities, including seismic operations, pipeline installations, road development and alignment, and well-sites and drilling. These guidelines, plus the revision of many fisheries guidelines, aid industry and government staffs in understanding the concerns and mitigating measures required to reduce impacts. In addition, guidelines and procedures were developed to aid staff input into the many grazing improvement programs.

One staff member has become qualified to work with instream flow needs for fisheries as well as providing expertise on fishways. His program is to establish, with Alberta Environment, acceptable methodologies and information bases to ensure that sufficient water is retained for wildlife and fisheries in the face of current and further develop-

ments for irrigation, impoundments and diversions on Alberta's rivers.

The key area maps for fisheries and wildlife were further refined during 1981/82 and revised referral maps were prepared. For planning purposes, staff started to relate key wildlife areas to the ecological land classification maps. These reflect a Fisheries and Wildlife Resource Management Strategy which is being prepared.

A Fish and Wildlife Provincial Plan was prepared with provision for public benefit and needs based on Fish and Wildlife resources, and contributes to the integrated land and water management planning.

The division is involved in three major planning efforts. The Land Planning and Referrals Section is participating in the extensive plans of regional planning commissions and municipal governments; an important area because these plans set the tone for future development on private land. A second area is the overall coordination and provision of input into the Departmental integrated resource planning efforts with more than 20 on-going plans plus grazing reserve plans. This effort has been a major divisional commitment requiring considerable field review, planning meetings and public involvement. A third area is the active involvement in water management planning activities.

Several comprehensive reviews and new initiatives in habitat management were also undertaken, including:

- A review of existing drainage programs in Alberta.
- The preparation of a Ducks Unlimited/Government of Alberta 10-year program.
- A joint workshop with the Alberta Forest Service to foster a more aggressive timber/wildlife management program.
- A major land management plan for the Buffalo Bay area involving three government agencies, private interests and the local community.
- Completion of the review of all fish and wildlife reservations on Crown land.

A series of meetings and seminars were held with regional staff to ensure coordination and consistency of input on different land use activities. These were required due to the regionalization process and were often held with other Department staff to foster stronger coordination, particularly in the referral process.

WILDLIFE BRANCH

The Wildlife Branch is responsible for the protection of the wildlife resource within the province, thus ensuring an adequate supply of wildlife for the

enjoyment of all Albertans.

Recent reorganization has enabled the Wildlife Branch to further define its role in the management of the wildlife resource. The branch has been divided into four sections: Biological Services, Wildlife Management, Wildlife Culture and Wildlife Habitat Development. These sections will provide the planning and coordination necessary to implement species management plans for both game and non-game species.

The Biological Services Section contains the research element of the Wildlife Branch. Research is an integral part of any management scheme. Studies are being conducted into the environmental and physiological causes of bighorn sheep mortality, the effects of prescribed burning as a tool for range improvement for bighorns and sharp-tailed grouse population dynamics. Research is also being conducted into the rehabilitation of peregrine falcons, the translocation of Canada geese and the monitoring of transplanted elk.

Aside from direct involvement in research programs, the research unit functions in an administrative role in assessing and approving research proposals from various post secondary educational institutions. A total of \$68 500 was granted to the University of Alberta for research into moose and elk bioenergetics, the pathology of moose ticks, lungworm transmission in bighorn sheep, the impact of fire on sharp-tailed grouse and the socio-economics of hunting in the Eastern Slopes. The University of Calgary received \$25 000 for work on the ecology of river otters, snowmobile impacts on wildlife, and the effect of dams on riparian habitat. The Wildlife Ecology Department of the University of Wisconsin also received \$10 000 towards an ongoing study of snowshoe hare population dynamics in Alberta. This study is part of a long-term research program in the Rochester area which is beginning to identify specific biological parameters of an important prey species in the province.

The Wildlife Management Section is composed of four subsections: Big Game Management, Bird Game Management, Commercial Wildlife Management, and Non-Game Management. This section addressed a number of aspects of wildlife management including the drafting of species management plans, the feasibility of game ranching in the boreal mixed-wood ecoregion of the province, problem wildlife and crop depredation, regulation formulation, trapper education and the development of humane trapping techniques. As well, the management section provided monetary grants to conservation-oriented organizations which enabled them to become involved in the preservation of wildlife resource in Alberta. Grants totalling \$50 750

were awarded to the Canadian Wildlife Federation, Fish and Game Association, Upland Birds of Alberta and the Alberta Trappers' Central Association.

The Game Management Group worked in conjunction with the Alberta Wildlife Park and the Lethbridge Regional Office to conduct one of the largest elk transplants in Alberta's history. Fifty animals (17 males and 33 females) originating at Elk Island National Park (EINP) were released at Pelican Mountain. Another five animals from EINP and 20 from Bob's Creek in southern Alberta (four males and 21 females) were released at Amadou Lake. This year the animals were held at the release site for several days prior to being released in an attempt to imprint them on the site and thus eliminate the migrations to agricultural areas that have occurred in the past. Another 22 animals were retained at the Alberta Wildlife Park for release in the fall of 1982.

Of the elk that were released, 37 of the females received colored neck collars for future identification. Twenty-eight of the collared females also were fitted with radio transmitters so that the herds' movements could be traced. This effort will provide wildlife managers with further knowledge of the methods necessary for optimum success in re-establishing elk.

Winter tick continued to be a problem for Alberta's moose population. This parasite, often associated with aspen parkland vegetation, is at the peak of an irregular cycle, and heavy infestations of ticks on moose were common. The resulting hair and blood loss from the moose in late winter leads to mortality from exposure and starvation. Air surveys were made during the winter in 1981 to monitor this mortality, and generally it was found die-offs were associated with animals in areas where the range quality was poor.

The extended cold period in January and February of 1982 also contributed to an increased winter mortality of wildlife species such as deer and moose, primarily in northern areas. The numbers of big game hunting authorizations in some northern wildlife management units has been reduced accordingly in an attempt to counteract this added natural mortality.

Hunting regulations were modified in late 1981 in preparation for the 1982 hunting seasons. Of interest, a special split season for elk was established in wildlife management unit F300 for the control of crop depredation, and a trophy elk season was established for Big Game Zone Six. Additional seasons for antlerless white-tailed deer were also incorporated.

A wildlife drug immobilization course was given in Edmonton in October, 1981, by the Game Management Section to instruct personnel in the

immobilization and handling of big game animals. Nearly 50 participants from the Alberta Wildlife Branch, the University of Alberta, Parks Canada and wildlife agencies in British Columbia and the Yukon attended.

The Game Management Section continued to monitor rabies in skunks and bats. Skunk dispersal and habitat utilization were determined in a rabies control area in southern Alberta in an attempt to gain more practical knowledge about the species, as skunks are a major transmitter of rabies.

Field work was completed on a six-year study in the Simonette River area on predation on cattle by wolves. Microwave detector-scarers were tested on elk in the Calgary Region as part of on-going research into methods of alleviating crop depredation by wild ungulates. Preparation of a problem wildlife prevention and technique manual was also coordinated.

Contingency plans for dealing with various types of nuisance grizzly and black bears were established and a brochure was prepared for industries that operate field camps, outlining methods of reducing potential bear problems.

The results of a co-operative (Alberta Fish and Wildlife Division/Canada Wildlife Service/U.S. Fish and Wildlife Service) waterfowl population survey indicated the number of breeding ducks in 1981 was again well below the long-term average. This was due to a continuing winter drought which greatly reduced suitable nesting habitat. Spring rains, which came too late to be of noticeable value to waterfowl seeking suitable nesting areas, did contribute somewhat to brood survival by maintaining water-levels on the more permanent wetlands.

The 1981 fall flight, while much below that enjoyed during 1969-1976, was comparable to the four preceding drought-reduced seasons. Hunting conditions varied throughout the province during the fall, which extended well into a mild November in most parts of the province. Overall, hunting opportunity and harvest were only marginally different from the previous season. The 1981 season marked the end of the third year of the Prairie Harvest Management Program, an agreement which will allow fixed or stabilized duck regulations over a five-year period.

Alberta's breeding population of large Canada geese was also affected by dry spring conditions, especially in the south where some nesting islands were high and dry or separated from the mainland by only shallow water. Breeding pair surveys indicate that the population growth experienced in recent years is now stabilized. Gosling surveys on major nesting lakes and the southern rivers showed production to be slightly higher than in 1980 but

about equal to recent years. Northern production of Arctic-nesting snow, white-fronted and lesser Canada geese was average to slightly above, with southward migration a little earlier than normal in most parts of the province. Very dry fall conditions in the major east-central staging area again resulted in a filtering-through rather than any build-up or major concentrations.

More than 1 800 resident Canada geese in southern Alberta were drive-trapped and banded. In addition, more than 800 goslings with adults were banded during the transplant program and many were moved to several habitat improvement projects in the central part of the province. In the Grande Prairie area, where a smaller project was initiated in 1978, nearly 200 local Canadas were banded during the summer. In the southeastern part of the province, 134 goslings in the company of 12 adult females were released on selected wetlands as part of a co-operative venture with the state of New Mexico.

Early in September, reports emanating from Montana described a massive contamination of waterfowl by the pesticide endrin. There was concern in Alberta that some birds from the northern part of that state may have moved into the province as part of the post-breeding, staging flights. Past banding records have indicated migrations of this nature from Montana. However, tests conducted on more than 70 waterfowl from the central and southern parts of the province indicated no trace of endrin.

The Government of Alberta and the Government of Canada entered into Crop Damage and Crop Damage Prevention Compensation agreements for a one-year period, for damage done to agricultural crops by migratory waterfowl. Each party committed a total of \$400 000 for crop depredation prevention and \$800 000 for crop damage compensation payments. Compensation was paid to a maximum of \$50 per acre on crops that were standing, swathed or stooked.

The warm fall weather of 1981 greatly facilitated the harvesting of crops with the result that crop damage by waterfowl was greatly reduced. Total crop damage prevention costs were about \$380 000 while compensation payments amounted to approximately \$500 000.

The Commercial Wildlife group assisted in the development of the Alberta Trapper Compensation Program. The review board, originally consisting of three members, was expanded to six in order to address concerns expressed by closely-related interest groups. During the year the review board evaluated 32 claims. Although some claims related to more than one aspect, the majority (22) involved

vandalism and theft. Approximately \$5 500 was authorized from the fund for such compensation. Six claims related to inconvenience and asset damage caused to trappers. Some \$3 600 was recommended to be paid by companies to compensate for these claims. Four claims related to loss of livelihood of habitat destruction. Approximately \$2 800 was recommended to be paid out for such causes. Three of the 32 claims were denied.

In addition, the review board provided advice to trappers and companies on a number of other impending claims. It is estimated that only 20 per cent of the claims are reviewed by the board, since most are claims settled by direct negotiations with the companies and trappers, often with the assistance of the trapline resource officers.

The first year of operation has been challenging since various guidelines on claim assessments had to be developed so a consistent approach to all claims occur. Survey techniques and preparation for the testing of humane trapping techniques occupied a great deal of time and effort during the latter half of 1981. One hundred and twenty six traps of 10 different designs were tested in Alberta in conjunction with the Western Fur Managers Conference. The Trapper Education Program conducted 22 classes which were completed by 295 students. This program provides trappers with techniques to efficiently utilize trapping skills while minimizing suffering by furbearing animals.

During the 1980/81 season, fur production in terms of dollar value decreased approximately 25 per cent from the previous season. This was reflected by a decrease in the number of beaver and coyote pelts sold by 20 and 40 per cent respectively. Squirrel pelt production dropped by 75 per cent. Nearly 80 000 pelts were marketed in 1981 by some 3 000 registered trappers and 4 500 resident trappers. There were approximately 1 800 registered trapping areas in the province.

A peregrine falcon recovery program jointly conducted in Alberta between the Non-Game Management Group of the Wildlife Management Section and the Canadian Wildlife Service continued in 1981. The efforts of the program are concentrated to achieve maximum production of captive young in order to provide for release programs and the supplementing of wild nest production. Ninety-nine young were bred and raised at the CV/S Wainwright Raptor Facility and an additional 10 were raised at the Black Diamond facility. Five were taken from wild nests to add to the captive breeding stock. Fourteen young were retained for breeding stock. The remaining 100 birds were distributed to release sites throughout Canada. Forty-four young were released in Alberta; 15 were fostered to wild nests in

northern Alberta, three were fostered to a pair of falcons in Edmonton, eight were released from the O.S. Longman Building in Edmonton, six were released from a known nest site along the Red Deer River, and 12 were released from a cliff site in Kananaskis Country. The remaining young were distributed to release sites in Yukon, Saskatchewan, Manitoba, Ontario and Quebec. Results of the 1980 releases were very promising. Two yearling males were observed in Kananaskis Country and four yearlings returned to Edmonton this past season. Two yearling females in Edmonton subsequently paired with adult males at the AGT Toll Building and the O.S. Longman Building. Three young peregrines were fostered to the new pair at the AGT Building. This was the first recorded fostering of young to an unproductive (courting but non-laying) pair of falcons. In 1982 we may see the first successful nesting in Alberta by a pair of captive bred and released falcons.

The Brooks Wildlife Centre, which represents the Wildlife Culture Section, was responsible for propagation and rehabilitation of upland game birds, waterfowl and raptors.

The 1981 pheasant-breeding flock consisted of 5 652 females and 545 males. They produced a total of 228 343 eggs, which in turn hatched 110 327 chicks. Approximately 91 400 chicks were released with 47 700 chicks (52 per cent) being given to 4-H Clubs, fish and game clubs, Upland Birds of Alberta and private raisers. The Wildlife Branch also provided \$10 000 grants each to the Alberta Fish and Game Association and Upland Birds of Alberta for construction of pheasant-rearing facilities. Wildlife Centre personnel released 43 700 pheasants into 75 suitable habitats in southern and central Alberta. These birds were used to supplement or establish local populations and as an incentive for landowners to retain or develop wildlife habitat.

A provincial management plan for ring-necked pheasants in Alberta is also being developed to manage both the wild birds and pheasants produced at the centre.

In addition, 62 000 coturnix quail were raised at the Brooks Centre from a total of 117 900 eggs. Sixty-four per cent of these were used in the peregrine rehabilitation program, while the remainder was utilized in other programs.

The Brooks Waterfowl Program was designed to enhance waterfowl species and provide for habitat development and protection through public awareness. In 1981, 324 Canada goose goslings were raised and used in transplant procedures. As well, field studies of breeding pair densities, evaluation of artificial nesting structures, disease monitoring and rehabilitation of injured or orphaned water-

fowl were carried out.

The 1981, Brooks Raptor Rehabilitation Program received 108 injured or young raptors which were unable to fend for themselves. Sixty-one of these birds have been released to the wild. A field study of the use of artificial nesting structures by prairie buteos was also initiated.

The Habitat Inventory and Development Section became part of the Wildlife Branch late in 1981 through reorganization. This section is responsible for the implementation and evaluation of the Buck for Wildlife Program. Buck for Wildlife — Wildlife

Projects, their status and expenditures, are shown in table 46. In 1980/81, \$332 380 was collected from sportsmen through a resource development stamp on hunting and fishing licences. A total of \$450 502 was spent in 1981 on habitat retention and habitat quality improvement, through 15 different projects. Sale of 1981/82 resource development stamps amounted to \$821 265 with a projected budget in 1982 of \$916 000. Considerable progress has been made in determining current and potential wildlife habitat capability as well as capsulizing wildlife objectives based on supply and demand criteria into land use objectives for planning programs.



Alberta Resource Industry Activities



Alberta Resource Industry Activities

ENERGY

Activity in Alberta's petroleum industry declined in all phases in 1981 from the record established the previous year. The downturn was attributable primarily to uncertainty about energy pricing, and a reduction in economic incentives related to the National Energy Program of 1980.

Well completions of 5 834 were off 17 per cent from the high of 1980 (see table 3). Development drilling recorded the largest drop, with completions down 21 per cent to 3 504 wells. Most of this was due to a 25 per cent decline in natural gas well development, arising out of uncertain increases in exports of natural gas to the U.S. Exploration drilling was off by 11 per cent to 2 330 wells, but oil successes maintained the 1980 pace at 381 wells because of continuing success in the region of established plays. The exploration success rate for oil wells increased slightly from 14 per cent to 16 per cent, while that for natural gas wells was down marginally from 47 per cent to 45 per cent. Average depth of all wells drilled in 1981 was down 35 metres to 1 160 metres (3 804 feet) (see table 4). This was due mainly to the severe decline in development drilling and a corresponding reduction in footage drilled.

Areas that attracted considerable exploration interest in 1981 were the Shekille-Zama-Amigo region in the extreme northwestern part of Alberta, where the objective was oil and natural gas in Devonian pinnacle reefs, and the Golden-Lubicon-Evi-Slave area in the north-central sector where exploration was directed toward oil objectives. Natural gas discoveries and/or field extensions were made in the Berland River, Simonette, Robb, Westeros, Ricinus West and Elsworth areas. A gas discovery at Hoadley, about 80 kilometres (km) (50 miles) south of Edmonton, may rank as the third largest natural gas field in Canada behind Elsworth and Milk River. The Edson Cardium oil trend, discovered in 1963, has now been extended over a distance of some 70 km (43 miles). Although activity in the West Pembina area was reduced during 1981, industry continued its search for Nisku pinnacle reefs in this and other prospective areas. The heavy oil area near Hayter, 75 km (47 miles) south of Lloydminster, experienced considerable drilling. Two areas very active during 1980, the Deep Basin area of west-central Alberta and the Nanton-Claresholm area in southwestern Alberta, experienced a much reduced level of activity.

Despite these discoveries, remaining established reserves of conventional crude oil decreased for the twelfth consecutive year to 696.0 million cubic metres (10^9 m^3) (4 380 10^6 bbls.). New reserves of conventional crude oil were boosted by a net

32.6 10^6 m^3 (205 10^6 bbls.). This included new-pool discoveries of 15.0 10^6 m^3 , reassessment of previously existing reserves of 10.4 10^6 m^3 , and 7.2 10^6 m^3 attributed to commencement or expansion of enhanced recovery schemes. Production continued to exceed new reserve additions by a wide margin, resulting in the 24.4 10^6 m^3 (153.5 10^6 bbl.) decline in remaining reserves. Remaining established reserves of marketable gas increased very slightly to 1795.3 billion cubic metres (10^9 m^3), or 63.7 trillion cubic feet (10^{12} Tcf) from 1747.0 10^9 m^3 (62.0 10^{12} Tcf) (see table 5). The addition of some 117.0 10^9 m^3 (4.2 10^{12} Tcf) to reserves was slightly above the average for the last decade. It included 29.0 10^9 m^3 resulting from discoveries made during the year, while the remaining 88.0 10^9 m^3 were attributed to development drilling, reassessment of previously discovered reserves and reserves discovered prior to 1981 but first recognized by the Energy Resources Conservation Board (ERCB) in 1981.

The ERCB for the first time recognized established reserves of natural gas in tight or unconventional gas zones in the Deep Basin area of western Alberta. Reserves of 10.3 10^9 m^3 (0.36 10^{12} Tcf) were assigned in the Elsworth region to a certain geological formation previously considered tight, but which the ERCB now believes will be productive when found in contact with large areas of existing, more productive zones.

Daily average production of crude oil and equivalent dropped almost 20.0 thousand cubic metres a day ($10^3 \text{ m}^3/\text{d}$) to 191.6 ($10^3 \text{ m}^3/\text{d}$) (1205.6 thousand barrels a day) (10^3 b/d) (see table 6). This continuing situation was worsened by the generally weak world economy, stepped-up conservation efforts, declining productive capacity of older fields and lower demand by Canadian consumers for petroleum products. Production cutbacks by Alberta began in March, 1981 to emphasize the province's opposition to the National Energy Program. Deliveries of crude oil and equivalent suffered a similar decrease, most markedly to Quebec and to the U.S., and to a lesser extent to Ontario. The 27.5 per cent decline in deliveries to Quebec and the Maritimes (see table 7) to 30.5 $10^3 \text{ m}^3/\text{d}$ (192.2 10^3 b/d) was a reflection of their weak economies. The decrease in central Canada was due partially to the continued connection of customers converting from heating oil to natural gas.

Alberta's production of marketable natural gas in 1981 decreased slightly to 62.0 10^9 m^3 (2.20 10^{12} Tcf), (see table 8) and deliveries within Canada also increased marginally. Slightly increased sales to Ontario and Quebec were mostly offset by reduced shipments to Saskatchewan,

Manitoba and British Columbia. Exports to the U.S. of $18.4 \times 10^9 \text{ m}^3$ ($0.65 \times 10^{12} \text{ Tcf}$) were down again as Canadian natural gas received strong price competition from that country's increasing indigenous supplies, the increased availability of Mexican natural gas and low-cost residual fuel, particularly in the western states, and from Canada's escalation of the export price.

The price of natural gas exported to the U.S. rose on April 1 to U.S. \$4.69 a gigajoule (\$4.94 a thousand cubic feet from U.S. \$4.24 a gigajoule (\$4.47 a thousand cubic feet). The major factor behind this increase was the partial tracking by Canada of escalating crude oil prices by the Organization of Petroleum Exporting Countries. However, in the light of the U.S. economic slowdown, and the availability of supplies of residual fuel and lower-priced indigenous natural gas, the National Energy Board did not recommend further price increases during the remainder of the year.

Energy pricing negotiations, which had been a dominant feature of the Canadian energy scene, were resolved by the Governments of Canada and Alberta signing a memorandum of agreement on September 1, 1981. The Energy Pricing and Taxation Agreement, set in place a framework for energy pricing and taxation through 1986. It provided for regular increases in the field price of conventional oil commencing October 1, 1981, subject to a ceiling of 75 per cent of the international price of oil delivered at Montreal. A pricing structure for conventional new oil and synthetic oil, the New Oil Reference Price, (NORP), was also introduced, to become effective January 1, 1982 applicable to oil discovered after December 31, 1980. Under the terms of the agreement the NORP would never exceed the international price of oil. The agreement also accorded a price increase to natural gas of 25 cents a thousand cubic feet, effective February 1, 1982 and every six months thereafter. The price will be converted to cents a gigajoule in the traditional manner determined by the National Energy Board. Also under the terms of the agreement, prices on natural gas bound for markets east of Alberta were to be set at the Alberta border. This action moved the pricing point from the Toronto city gate, eliminating Alberta's burden of paying for transportation costs.

Production was down for all products obtained from the processing of natural gas. Propane production dropped to $14.2 \times 10^9 \text{ m}^3/\text{d}$ ($88.9 \times 10^3 \text{ b/d}$) from $14.4 \times 10^9 \text{ m}^3/\text{d}$ ($90.8 \times 10^3 \text{ b/d}$) (see table 6). Butanes production declined to $8.6 \times 10^9 \text{ m}^3/\text{d}$ ($53.9 \times 10^3 \text{ b/d}$) from $8.9 \times 10^9 \text{ m}^3/\text{d}$ ($56.0 \times 10^3 \text{ b/d}$). Deliveries of propane also experienced a slight decline, while deliveries of butanes increased only 2.1 per cent to

$9.3 \times 10^9 \text{ m}^3/\text{d}$ ($58.6 \times 10^3 \text{ b/d}$). Sulphur production was down again, falling to 5 403 thousand tonnes (10^6 t) (5 573 thousand long tons) (10^3 l.t.) from 5 728 10^6 t (5 638 10^3 l.t.) in 1980. Exports to the offshore and to the U.S. continued the increase begun in 1976, raising total deliveries by 220 10^6 t (216 10^3 l.t.) to 7 709 10^6 t (7 587 10^3 l.t.). Production of sulphur from the processing of oil sands was down 13.3 per cent to 248 10^6 t because of various problems during the year at the two plants near Fort McMurray.

The average plant gate price for sulphur jumped dramatically to \$81/t (\$83/l.t.) from \$58/t (\$59/l.t.), due to increased demand from premium-priced offshore markets. Some 159 10^6 t (156 10^6 l.t.) were stockpiled at various gas plant locations in Alberta at the end of 1981. The stockpiling had resulted from a lack of markets before 1980 for a portion of the production, as well as to an historical shortage of slating, loading and transportation facilities and limited ocean-terminal storage capacity. With recently improved markets, producers reduced their stockpiles during the year by some 2.3 10^6 t (2.2 10^6 l.t.).

Bonuses for petroleum and natural gas rights were down markedly to \$588 million from the 1980 record of \$1 004 million. The year began with bids off suddenly, particularly for licence dispositions. By mid-year, however, bidding activity turned around in the northern area raising bonuses there by year-end by \$139 million to \$431 million. Bonuses for rights in the other two areas were down significantly, with the Foothills area seeing a 72 per cent decrease to \$58 million from \$209 million. The average price a hectare (ha) declined to \$372 (\$148/acre) from \$406 (\$162/acre). The average price jumped in the northern area for both licence and lease lands, but this was more than offset by large decreases in the other two regions.

It was a troubled year for the major oil sands ventures planned for Athabasca and Cold Lake. Esso Resources suspended construction on its Cold Lake project in July, pending the possibility of an agreement on energy pricing and taxation between the federal and Alberta governments. Despite the signing of such an agreement on September 1, the viability of both projects remained uncertain. At year-end 37 experimental schemes were active, although the large Amoco in situ operation at Gregoire Lake in the Athabasca deposit had been discontinued because major technical problems were encountered with the production technique. Production from the two commercial plants near McMurray was down almost 13 per cent to $17.7 \times 10^9 \text{ m}^3/\text{d}$ ($111 \times 10^3 \text{ b/d}$) from $20.3 \times 10^9 \text{ m}^3/\text{d}$ ($128 \times 10^3 \text{ b/d}$). Both plants had longer than anticipated shut-downs, and one of them experienced additional

problems in its process area and with tie-ins to the expanded part of the plant.

Growth in the Alberta coal industry continued strong in 1981. Drilling increased in the Mountain Region, where bituminous metallurgical coal is located, and in the Foothills Region, a source of high-grade bituminous thermal coal. Interest in the deeper coals of the Plains Region continued with substantial drilling activity in the vicinity of producing and developing mines, and in other areas such as Picardville, Chip Lake and the Buffalo Hills.

Construction began on a new metallurgical coal mine at Gregg River, the first one in Alberta in 10 years. The open-pit mine and processing facilities will produce some 2.4 million tonnes (10⁶t) (2.6 million short tons (10⁶ s.t.) of coal annually to meet contracts with Japanese steel mills. Deliveries are to begin in April, 1983. Development of steam coal in the Lethbridge area was under study, but production may be delayed until 1985 because of low rail capacity to the West Coast. Development began on a new underground mine at Coal Valley to produce metallurgical coal. The Paintearth mine near Forestburg was started to replace the Diplomat mine, currently close to being depleted. The new mine will supply coal to the Battle River thermal generating station which was expanded during the year. A permit was issued to Edmonton Power for a new strip mine at Genesee which will provide coal for the City of Edmonton's proposed thermal power plant some 70 km (43 miles) southwest of the city.

Production of marketable coal (see table 9) increased marginally in 1981 to 18.4 10⁶t (20.2110⁶ s.t.) from 17.9 10⁶t (19.7110⁶ s.t.). Marketable bituminous coal production decreased to 6.8 10⁶t (7.5 10⁶ s.t.) from 7.3 10⁶t (8.1 10⁶ s.t.). Deliveries of marketable coal (see table 10) in Canada increased by 1.1 10⁶t to 13.6 10⁶t (15.0 10⁶ s.t.), but exports fell 21.6 per cent to 4.1 10⁶t (4.6 10⁶ s.t.) from 5.3 10⁶t (5.8 10⁶ s.t.). Exports of metallurgical coal were down 11.5 per cent to 6.2 10⁶t, with Japan accounting for almost all of the reduction. Use of thermal coal in Alberta was up 9.1 per cent to 11.1 10⁶t (12.2 10⁶ s.t.), but sales to other provinces in Canada were down 56.4 per cent to 77.0 10⁶t (84.9 10⁶ s.t.).

The value of Alberta's marketable coal in 1981 was estimated to be \$482 million, a rise of \$115 million over 1980. Most of the increased value was for bituminous thermal coal which had an increase in its average mine price to \$42.99/t (\$39.00/ s.t.) from \$26.68/t (\$24.20/s.t.). The average mine price for bituminous metallurgical coal rose \$14.66/t (\$13.30/ s.t.) to \$62.83/t (\$57.00/ s.t.). The price for subbituminous coal was up 9.6 per cent to \$6.06/t (\$5.50/ s.t.).

Remaining established reserves (see table 5)

of Alberta coal were estimated to be 14.72 billion tonnes (10⁹t) (16.24 10⁹ s.t.) at the end of 1981. Sub-bituminous coal reserves were 11.9 10⁹t (13.1 10⁹ s.t.), while reserves for metallurgical and thermal grades stood at 1.6 10⁹t (1.8 10⁹ s.t.) and 1.22 10⁹t (1.34 10⁹ s.t.), respectively.

FOREST

The forested area of Alberta covers more than 60 per cent of the province. Approximately 164 050 square kilometres (63 000 square miles) are classified as productive forest land and an additional 71 905 square kilometres (27 750 square miles) have the potential to produce forest products. The remaining area is composed mainly of rock, muskeg and wetland, and is not considered capable of producing timber.

The productive forest consists of approximately 52 000 square kilometres (20 000 square miles) of mature and overmature timber growth and 112 000 square kilometres (43 000 square miles) of regeneration, young and immature growth. There are approximately 1.7 billion cubic metres (60 million cubic feet) of wood in Alberta forests, of which 1.0 billion cubic metres (36 billion cubic feet) are softwood (spruce, pine, fir, larch) and 0.7 billion cubic metres (24 billion cubic feet) are hardwood (poplar, birch).

Alberta's present productive forest land will support an annual harvest of about 13.8 million cubic metres (487 million cubic feet) of softwoods and 11.7 million cubic metres (413 million cubic feet) of hardwoods. The province has allocated cutting rights to industry under long-term quotas and forest management agreements, authorizing the annual harvest of almost 8.0 million cubic metres (283 million cubic feet) of softwoods and 0.1 million cubic metres (four million cubic feet) of hardwood timber.

Timber production on Crown lands increased from 6.6 million cubic metres (233 million cubic feet) in 1980/81, to 7.4 million cubic metres (261 million cubic feet) in 1981/82. Deciduous timber production approximated two per cent of the total provincial timber cutting of Crown lands. Increased production of lumber and plywood (coniferous) accounted for the largest portion of timber production increase.

The total value of forest products cut on Crown lands in 1981/82 increased to \$251 million from \$236 million of the previous year.

Timber dues remained fixed at \$0.70 per cubic metre (\$3 per Mfbm) for sawtimber.

Relevant statistics for the forest industry are shown in tables 28, 29 and 30.

LANDS

The total area of Alberta is 661 185 square kilometres (255 285 square miles) or some 66 million hectares (163 million acres). About 62 per cent is under provincial control, 10 per cent is federal Crown, one per cent is Indian reserves and the remaining 27 per cent is privately owned. In excess of 60 per cent of all lands in the province are non-settled — largely the forested regions of the province.

Of the public lands under disposition, about 0.29 million hectares (0.73 million acres) are under disposition leading to title and include 0.17 million hectares (0.42 million acres) of civilian and veteran homestead sales and leases. About 2.89 million hectares (7.1 million acres) are under lease not leading to title, and include 2.31 million hectares (5.7 million acres) of grazing leases and permits. In addition, there is in excess of 0.28 million hectares (0.70 million acres) in grazing reserves.

Active development of grazing reserves continued during the past fiscal year and included such operations as clearing, burning, breaking, seeding, aerial spraying, fertilizing, fencing and water development. These development activities involved contracts covering some 68 000 hectares (168 000 acres) and cost \$6.46 million — approximately \$4.98 million of which was funded by the Alberta Heritage Savings and Trust Fund.

Economic deposits of sand and gravel are found extensively throughout Alberta. The major use of gravel in Alberta is in road-building which accounts for about two-thirds of the total used. Other major uses are for construction and for railroad ballast. Sand is also widely used in construction with the better quality types used in the manufacture of asphalt roofing and glass fibre products.

At the fiscal year-end there were 416 sand and gravel leases and surface materials leases in effect on public lands. In addition, during the year, there were 698 surface materials licences issued.

The Public Lands Division levies a surcharge on sand and gravel removed from pits developed by the province. This allows for recovery of development costs and provides funds for reclamation.

Public Lands' revenue, including the sale of land, amounted to \$19.4 million. Major contributors of revenue were the sale of public lands (\$8.2 million), leases for oil and gas exploration and development (\$3.9 million), grazing leases and permits (\$3.3 million), sand and gravel and other surface materials royalties, surcharges, lease fees, and miscellaneous (\$4.0 million).

FISH AND WILDLIFE

Based on the large numbers of licences sold, hunting, fishing, trapping and recreational pursuits by Albertans continued to be very popular.

Although many merchants reported a downturn in general sales, Albertans continued to spend considerable money on hunting, fishing, boating and related recreational activities. Consumer expenditures on these traditional outdoor pursuits continued despite escalating costs in fuel, equipment and travel. Specific cost figures may be available following the analysis of the 1982 survey of the value of wildlife to Canadians.

In 1981, receipts to the Provincial Treasurer from hunting, fishing and trapping permits, fees, licence sales and royalties totalled \$6 218 000. In the settled and agricultural areas of the province where resident trapper licences are required, a slight decline in permit sales occurred because a new form called the permission to trap was issued and made available to accompany each resident trapper licence. This form allowed resident trappers having the owner's written permission to trap on private or leased land without a separate licence. In 1981, there were more than 4 500 resident trappers and 2 996 registered trappers on 1 800 registered trapping areas in Alberta. The number of raw fur buyers, taxidermists, furriers and tanners remained unchanged in 1981.

Fur prices declined for mink, lynx and beaver, thus causing a drop in the overall return to trappers, which in 1981 is estimated to be \$10 million. Beaver prices showed the biggest drop, being down 20 per cent in 1981. Also significant was the unusually low water levels which reduced the number of muskrats in many traditionally productive areas. Coyote prices started strong but fell significantly by March, 1981.

Both sport and commercial fishing continued to be popular throughout the province. In 1981, 2 462 commercial fishermen caught 2 127 259 kg of fish which provided them with \$1 565 544, a retail market value of \$3 172 156.

The division continued its fish hatchery and rearing upgrading programs. Plans were made final for a new trout hatchery and brood stock site in the Eastern Slopes Region. Development activities in small ponds and reservoirs in Kananaskis Country are near completion and now contain catchable-sized rainbow trout. Sport fishing licence sales numbered 323 775 in 1981.

Statistics



Statistics

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Table 1

Exploratory Agreements Issued and Administered Number, Hectares, (Acres)

Type	Active March 31/81	Issued	Reinstated	Divided	Renewed	Cancelled	Active March 31/82
Petroleum and natural gas reservations	130 981 842 (2 426 132)	-- -- --	-- -- --	-- -- --	-- -- --	106 769 565 (1 901 595)	24 212 276 (524 534)
Natural gas licences	14 85 214 (210 564)	8 46 784 (115 603)	-- -- --	-- -- --	-- -- --	16 88 094 (217 680)	6 43 904 (108 487)
Oil sands prospecting permits	29 294 624 (728 016)	7 40 313 (99 614)	-- -- --	-- -- --	9 56 494 (139 585)	19 230 464 (569 477)	17 92 014 (227 367)
Quartz exploration permits	28 193 472 (478 070)	-- -- --	-- -- --	-- -- --	-- -- --	22 167 104 (412 914)	4 26 368 (65 155)
Petroleum and natural gas licences	2 245 5 737 768 (14 178 024)	564 1 058 056 (2 614 457)	2 3 968 (9 805)	-- -- --	-- -- --	534 1 590 597 (3 930 390)	2 277 5 196 360 (12 840 206)
Total	2 446 7 292 920 (18 020 806)	-- -- --	-- -- --	-- -- --	-- -- --	-- -- --	2 328 5 570 922 (13 765 748)

SOURCE: Mineral Resources Division

Table 2
Active Mineral Leases
Number, Hectares, (Acres)

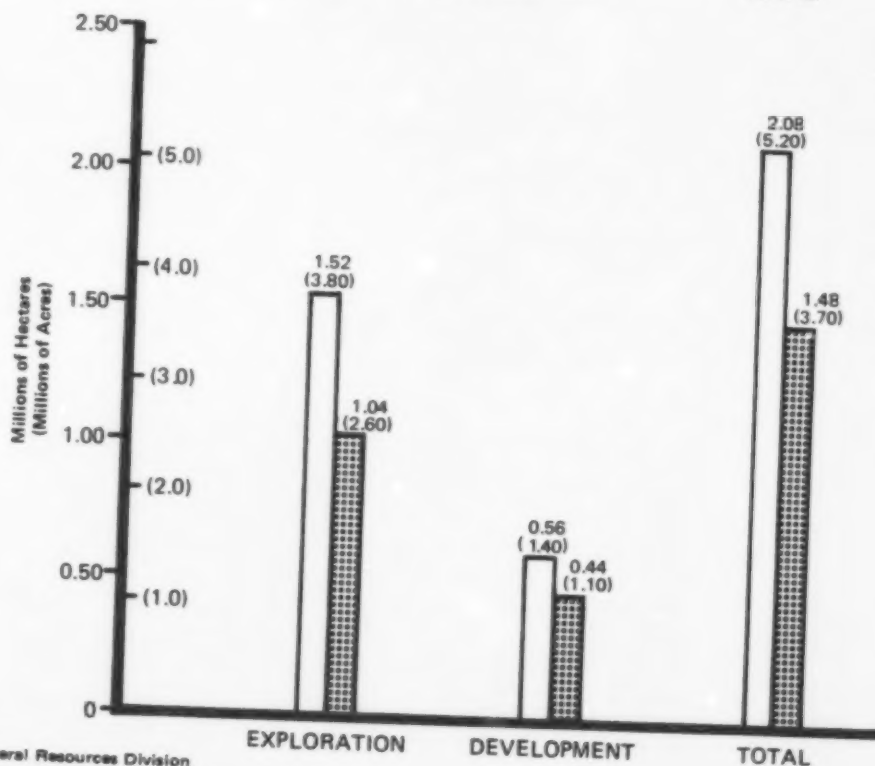
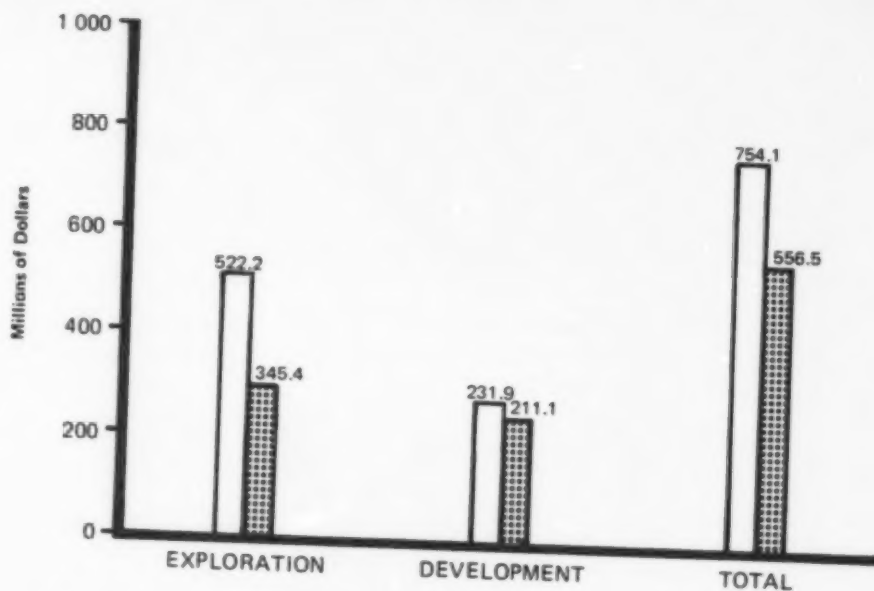
Type	Active March 31/81	Issued	Reinstated	Divided	Renewed	Cancelled	Active March 31/82
Petroleum and natural gas	45 108 21 592 012 (53 353 861)	3 351 2 611 758 (6 453 654)	10 16 003 (39 543)	1 --- ---	--- --- ---	1 956 787 257 (1 945 312)	46 513 22 739 925 (56 109 355)
Natural gas	2 096 3 605 620 (8 909 487)	46 82 398 (203 605)	2 6 535 (16 148)	--- --- ---	--- --- ---	27 18 657 (46 101)	2 117 3 624 707 (8 956 651)
Petroleum	27 20 307 (50 179)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	27 20 115 (49 704)
Bituminous sands	41 482 329 (1 191 835)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	3 38 200 (94 392)	38 444 129 (1 097 443)
Oil sands	172 1 706 841 (4 217 604)	31 347 576 (858 860)	--- --- ---	--- --- ---	3 55 265 (136 660)	--- --- ---	203 2 054 417 (4 965 529)
Coal	3 284 1 692 717 (4 182 704)	131 119 008 (294 069)	1 960 (2 372)	--- --- ---	19 1 890 (4 670)	158 81 201 (200 648)	3 258 1 724 268 (4 260 666)
Road allowance coal	456	2	---	---	---	6	452
Quarrying	92 9 411 (23 255)	5 101 (250)	--- --- ---	--- --- ---	--- --- ---	7 625 (1 544)	86 8 887 (21 960)
Salt	5 1 146 (2 832)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	5 1 146 (2 832)
Iron	2 3 962 (9 790)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	2 3 962 (9 790)
Sodium sulphate	2 863 (2 133)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	2 863 (2 132)
Quartz minerals	29 122 472 (302 626)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	1 387 (956)	28 122 084 (301 670)
Placer mineral lease	--- --- ---	7 1 302 (3 217)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	7 1 302 (3 255)
Special minerals	14 1 333 (3 294)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	14 1 333 (3 294)
Other agreements	7 491 221 (1 213 807)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	1 64 (158)	8 491 157 (1 213 649)
Total	51 335 29 730 234 (73 463 409)	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	52 758 31 238 295 (77 189 827)

SOURCE: Mineral Resources Division

Chart 1

ALL CROWN SALES
PETROLEUM AND NATURAL GAS RIGHTS

1980/81
1981/82

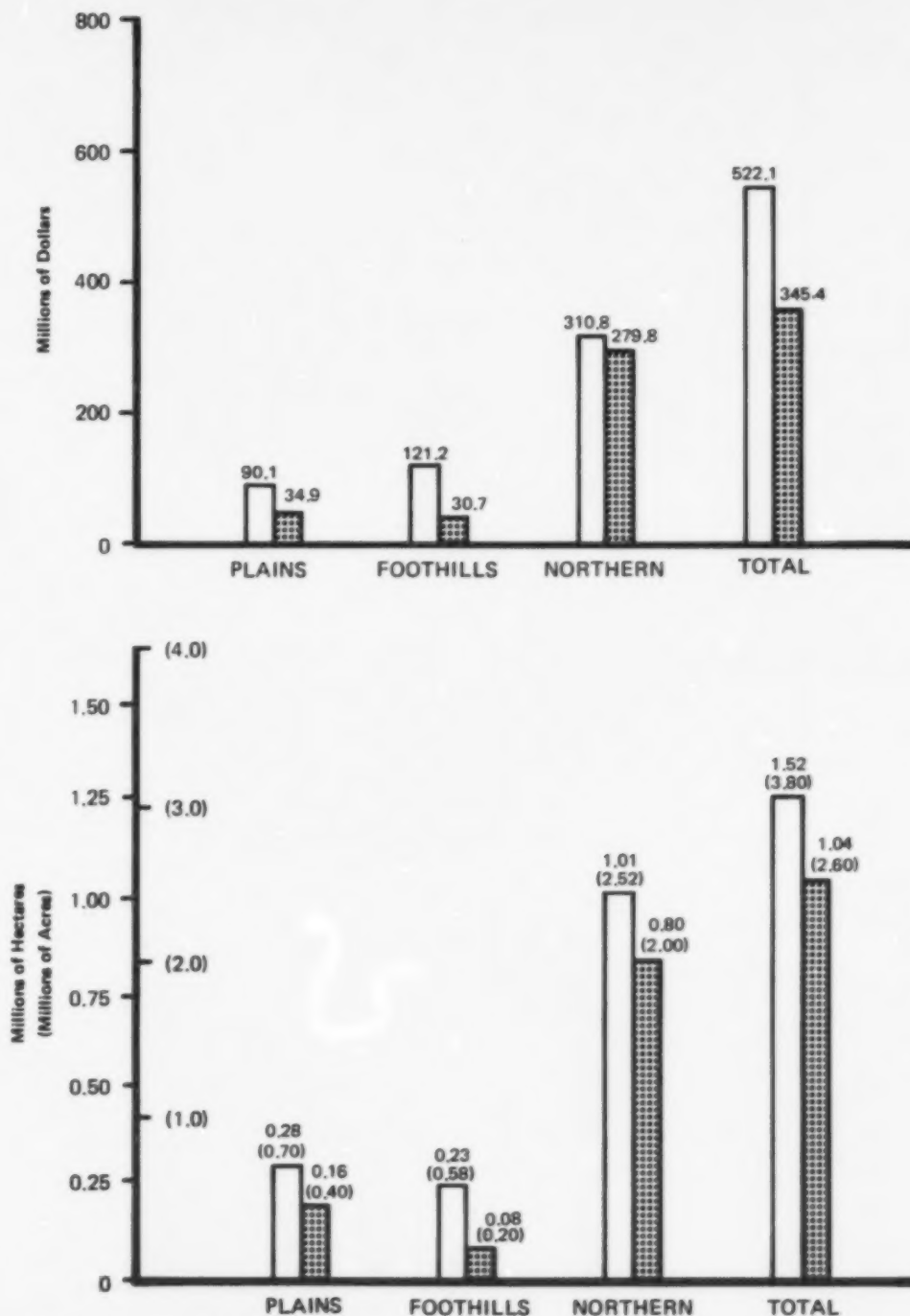


* Source: Mineral Resources Division

Chart 2

**CROWN LICENCE SALES
PETROLEUM AND NATURAL GAS RIGHTS**

1980/81
1981/82

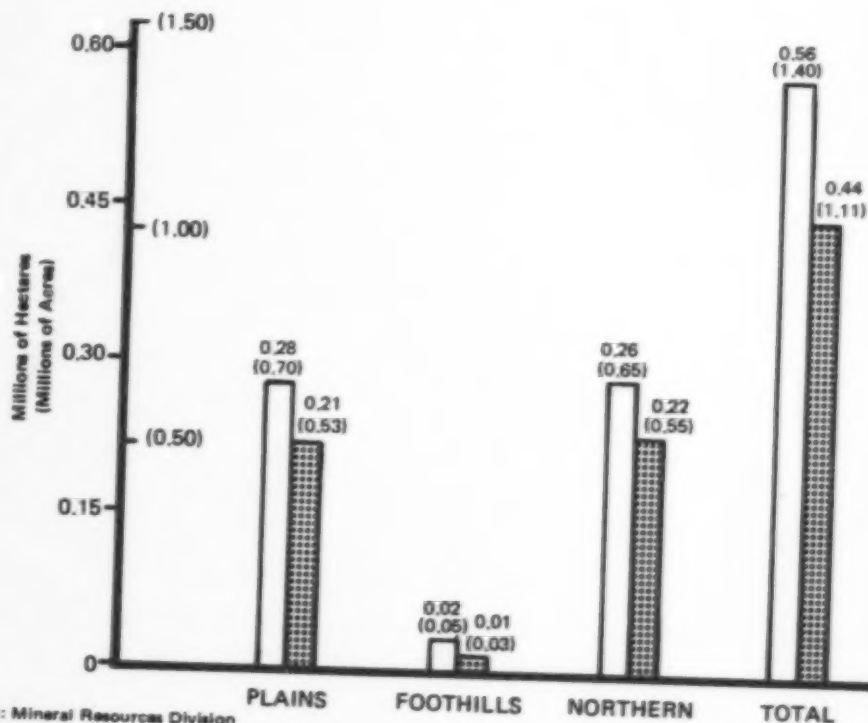
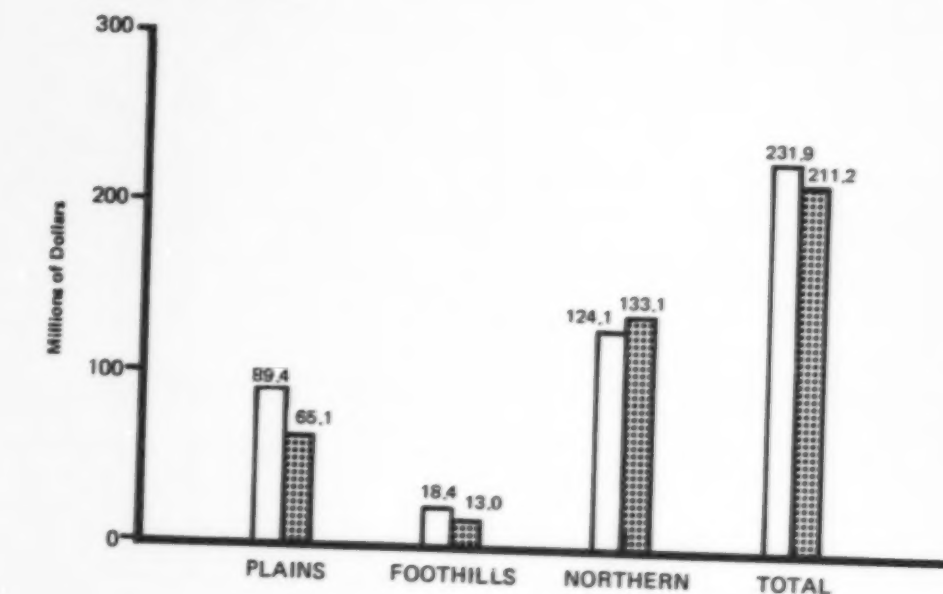


Source: Mineral Resources Division

Chart 3

CROWN LEASE SALES
PETROLEUM AND NATURAL GAS RIGHTS

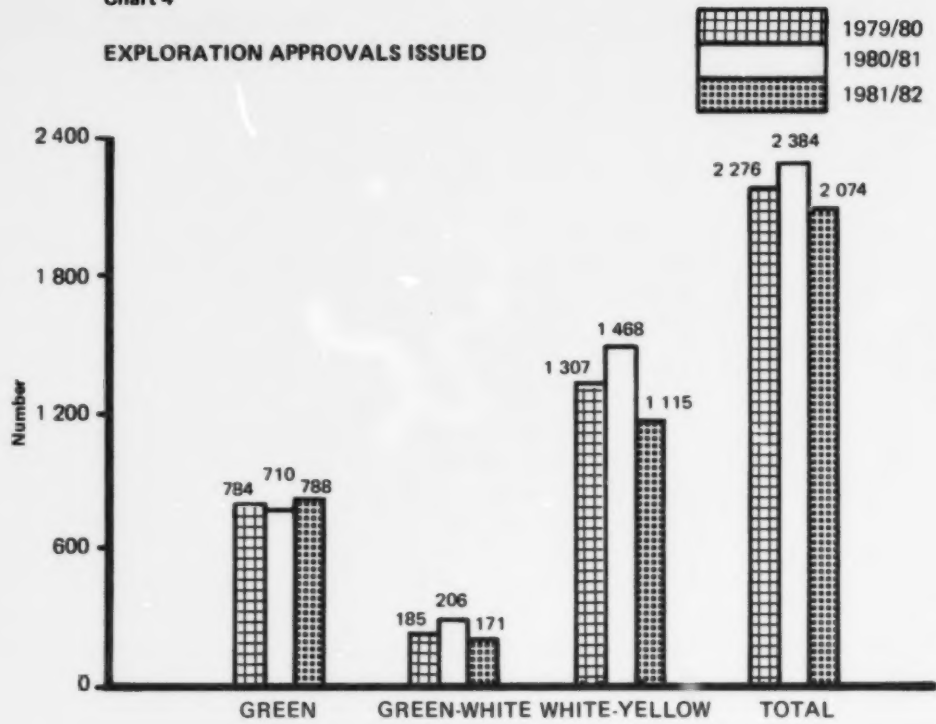
1980/81
1981/82



Source: Mineral Resources Division

Chart 4

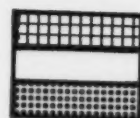
EXPLORATION APPROVALS ISSUED



Source: Mineral Resources Division

Chart 5

COMPLAINTS RELATED TO
GEOPHYSICAL ACTIVITY

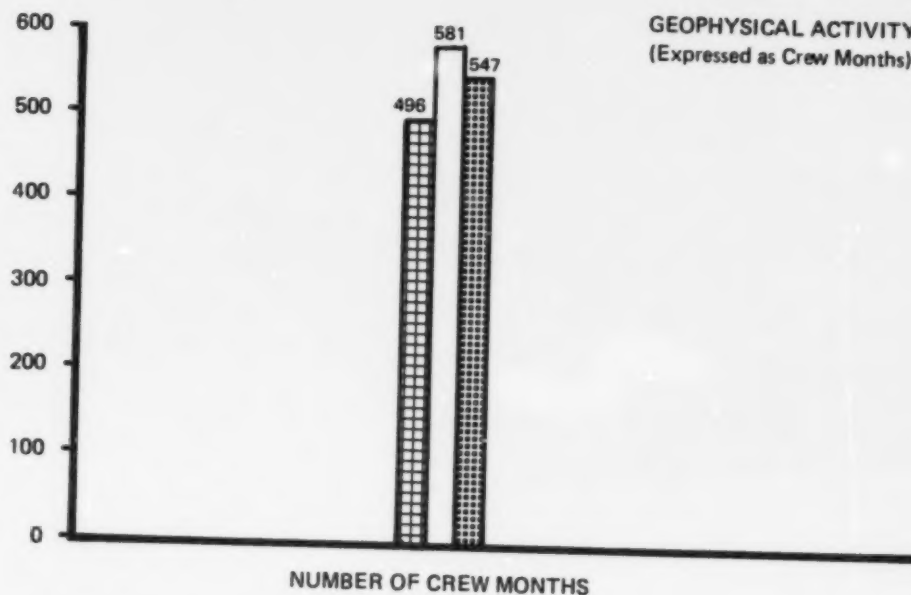


1979/80

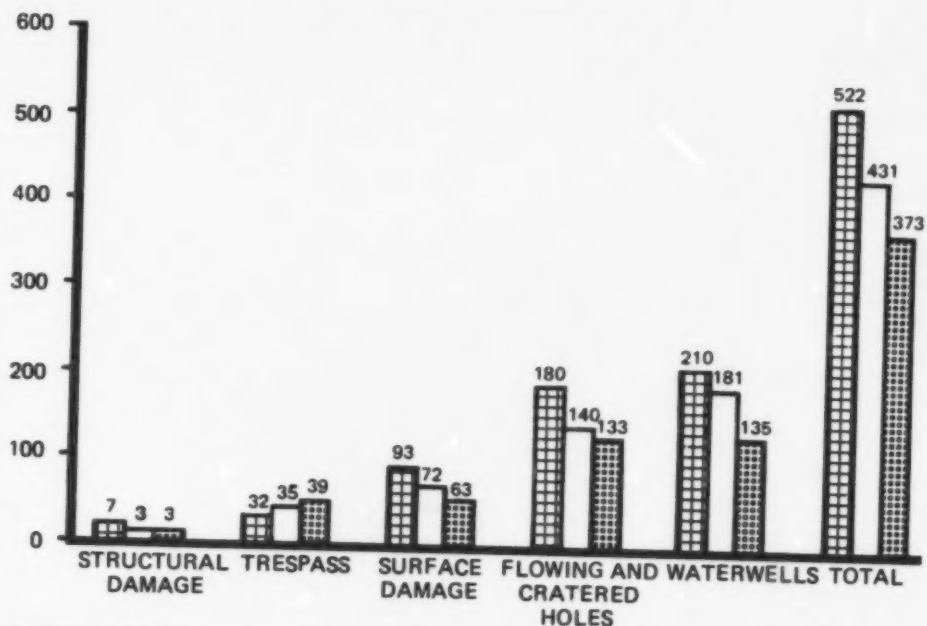
1980/81

1981/82

GEOPHYSICAL ACTIVITY
(Expressed as Crew Months)



COMPLAINTS



Source: Mineral Resources Division

Map Group 1

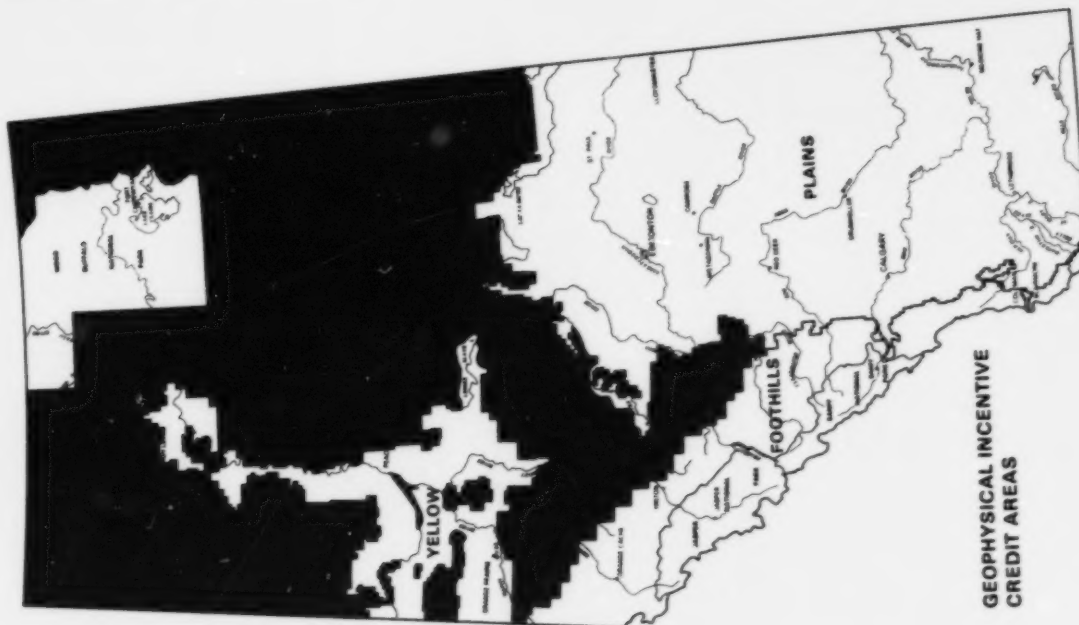
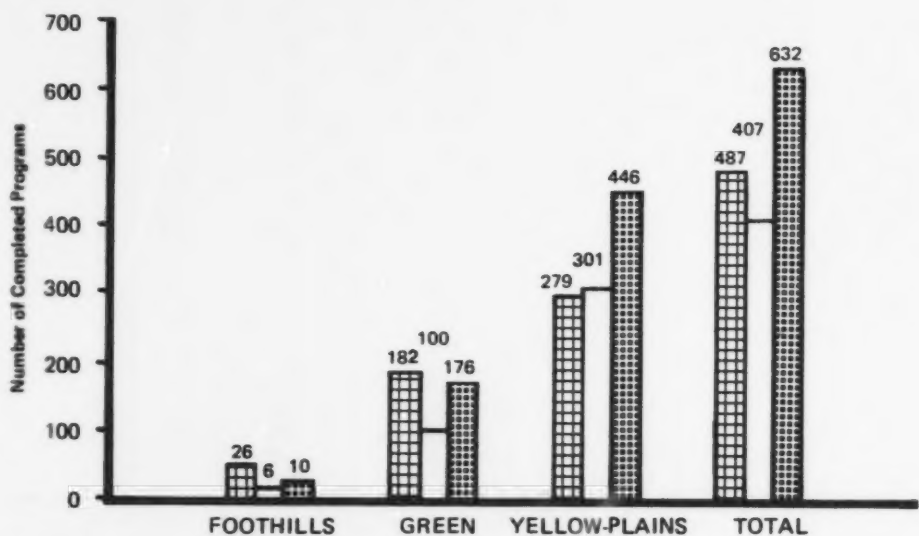
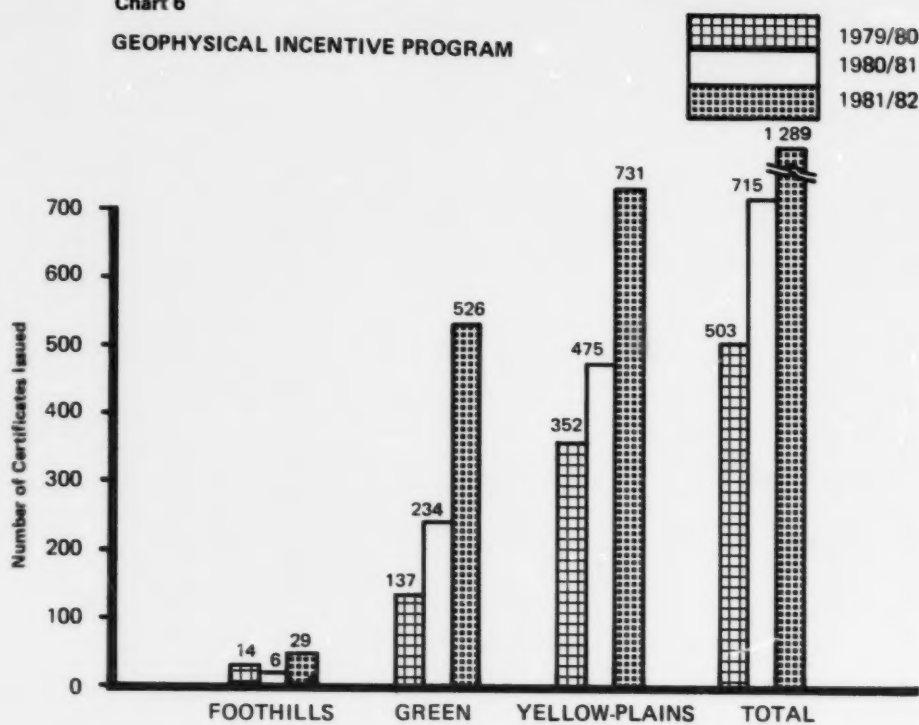
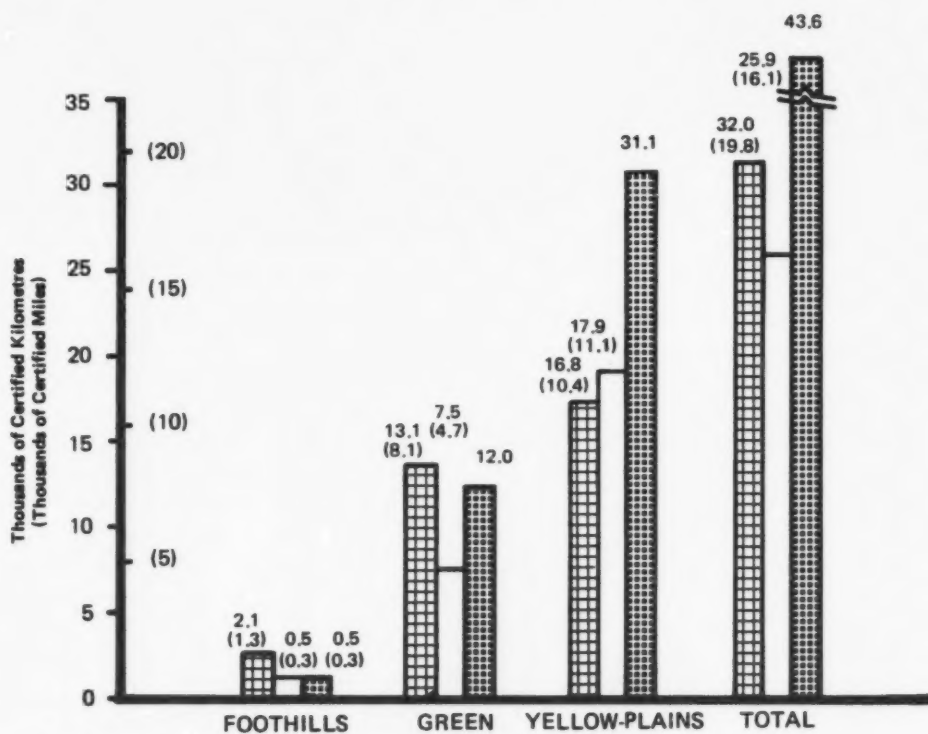
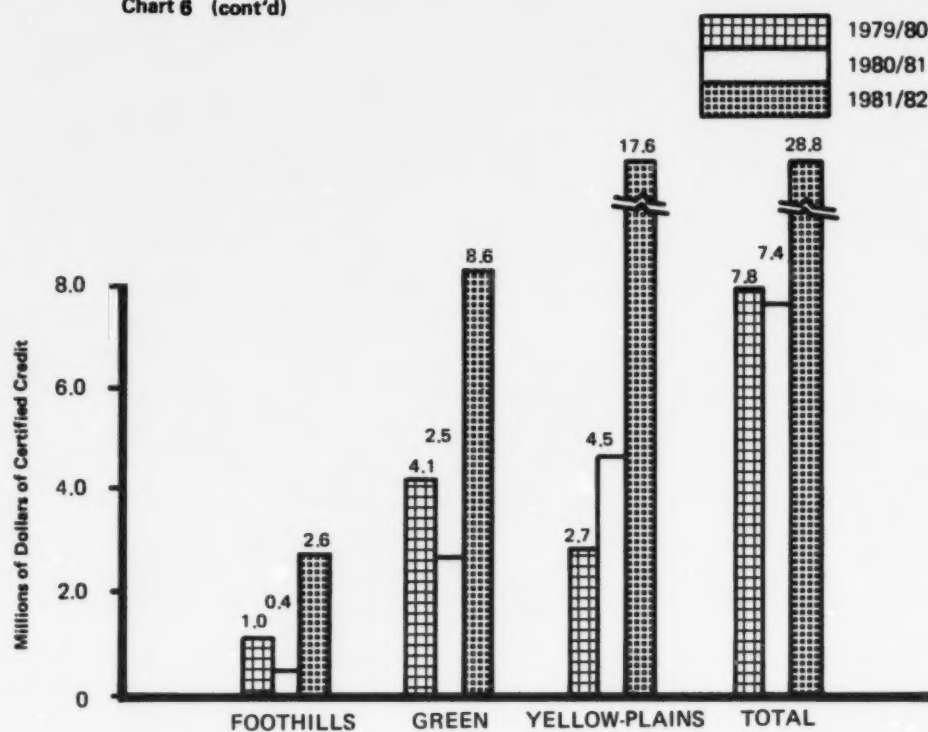


Chart 6
GEOPHYSICAL INCENTIVE PROGRAM



Source: Mineral Resources Division

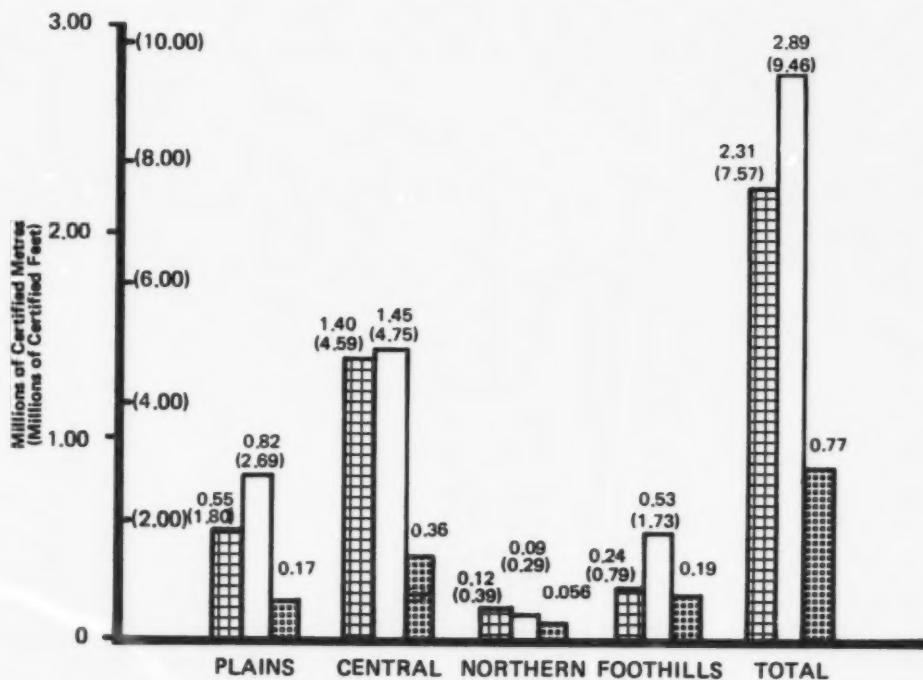
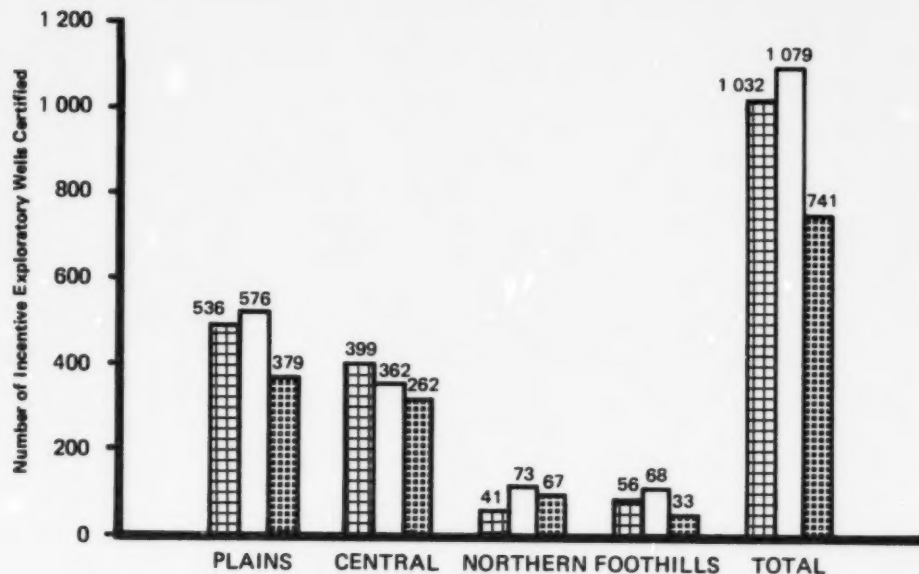
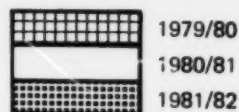
Chart 6 (cont'd)



Source: Mineral Resources Division

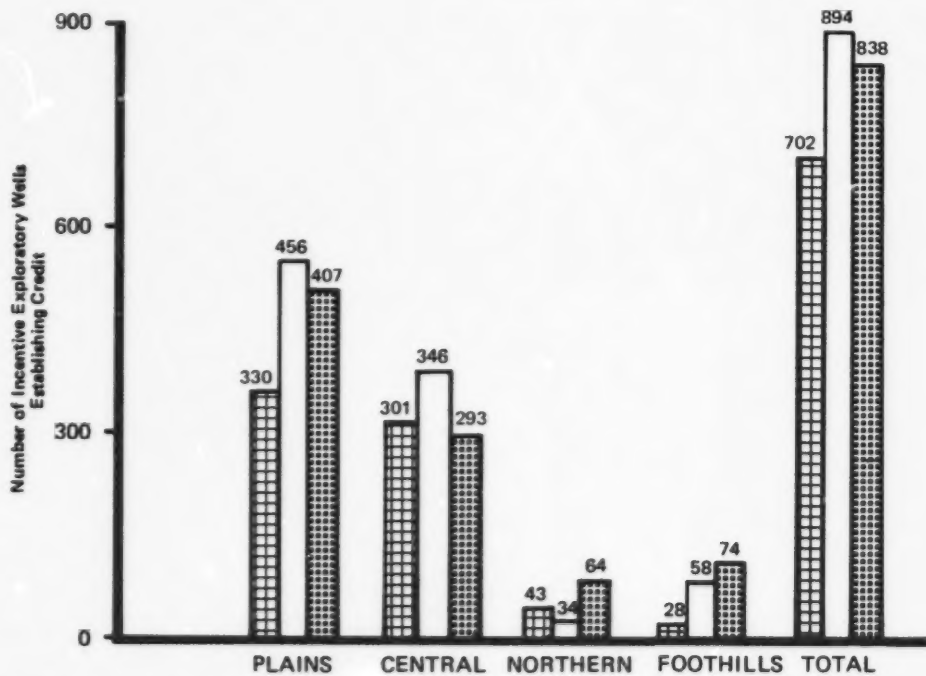
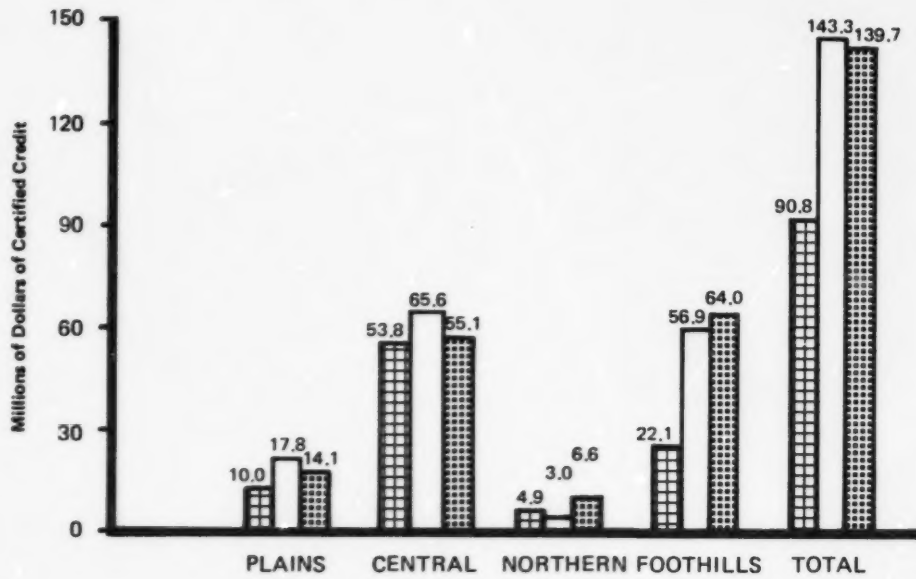
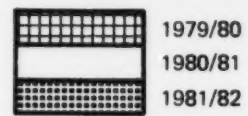
Chart 7

EXPLORATORY DRILLING
INCENTIVE SYSTEM



Source: Mineral Resources Division

Chart 7 (cont'd)



Source: Mineral Resources Division

Table 3

Wells Drilled Alberta Oil and Gas Industry

Calendar Year

	1980 number	1981 number
Exploration		
Total wells drilled	2 623	2 330
Successful (oil)	377	381
Successful (gas)	1 221	1 044
Development		
Total wells drilled	4 425	3 504
Successful (oil)	1 229	1 044
Successful (gas)	2 674	2 012
Total wells drilled ^a	7 048	5 834

SOURCE: Alberta Energy Resources Conservation Board

^a Includes unsuccessful, service and suspended wells but excludes miscellaneous wells drilled.

Table 4

Footage Drilled Alberta Oil and Gas Industry

Calendar Year

	1980		1981	
	kilometres	thousands of feet	• kilometres	thousands of feet
Exploratory	3 703	12 149	3 168	10 394
Development	4 716	15 472	3 598	11 804
Total	8 419	27 621	6 766	22 198

SOURCE: Alberta Energy Resources Conservation Board

Table 5

Remaining Established Reserves

Calendar Year

	1980	1981	Percentage Change
Conventional crude oil	720.4 10^6 m ³ (4 533.5 10^6 bbls.)	696.0 10^6 m ³ (4 379.9 10^6 bbls.)	(3.4)
Synthetic crude oil	3 860.0 10^6 m ³ (24.3 10^9 bbls.)	3 860.0 10^6 m ³ (24.3 10^9 bbls.)	0.2
Pentanes plus ^a	104.7 10^6 m ³ (658.9 10^6 bbls.)	127.4 10^6 m ³ (801.7 10^6 bbls.)	21.7
Marketable gas	1 747.0 10^9 m ³ (62.0 10^{12} cf)	1 795.3 10^9 m ³ (63.7 10^{12} cf)	2.8
Propane	119.7 10^6 m ³ (754.1 10^6 bbls.)	123.4 10^6 m ³ (777.4 10^6 bbls.)	3.1
Butanes	69.8 10^6 m ³ (439.5 10^6 bbls.)	70.4 10^6 m ³ (443.3 10^6 bbls.)	0.9
Sulphur ^b	114.8 10^6 t (113.0 10^6 long tons)	119.3 10^6 t (117.4 10^6 long tons)	3.9
Coal	14.4 10^9 t (14.9 10^9 short tons)	14.7 10^9 t (16.2 10^9 short tons)	9.6

SOURCE: Alberta Energy Resources Conservation Board

Note: Abbreviations used: 10^6 = million; 10^9 = billion; 10^{12} = trillion;
bbls. = barrels; cf = cubic feet; m³ = cubic metres; t = tonnes

^a A mixture mainly of pentanes and heavier hydrocarbons, which ordinarily may contain some butanes and which is obtained from the processing of raw gas, crude oil or condensate.

^b From natural gas processing plants

Table 6

Alberta Liquids Production

Calendar Year

	1980		1981		Percentage Change
	thousand cubic metres/day	thousand barrels/day	thousand cubic metres/day	thousand barrels/day	
Conventional crude oil	173.2	1 089.6	156.1	982.4	(9.8)
Experimental crude oil	1.5	9.6	2.1	13.0	40.0
Synthetic crude oil	20.3	127.8	17.7	111.1	(12.8)
Pentanes plus ^a (includes condensate)	16.4	103.4	15.7	99.1	(4.3)
Subtotal crude and equivalent	211.4	1 330.4	191.6	1 205.6	(9.4)
Propane ^b	14.4	90.8	14.2	88.9	(2.1)
Butanes ^b	8.9	56.0	8.6	53.9	(3.4)
Total liquids	234.7	1 477.2	214.4	1 348.4	(8.7)

SOURCE: Alberta Energy Resources Conservation Board

^a A mixture mainly of pentanes and heavier hydrocarbons, which ordinarily may contain some butanes and which is obtained from the processing of raw gas, crude oil or condensate.

^b Includes production only from processing of natural gas, but excludes that used for solvent flooding.

Table 7

Production and Disposition of Crude Oil and Pentanes Plus^a

Calendar Year

	1980		1981		Percentage Change
	thousand cubic metres/day	thousand barrels/day	thousand cubic metres/day	thousand barrels/day	
Production	211.4	1 330.4	191.6	1 205.6	(9.4)
Disposition					
Alberta	44.1	277.2	42.6	268.4	(3.4)
Canada excluding Alberta:					
British Columbia	20.5	128.7	20.4	128.5	(0.5)
Saskatchewan and Manitoba	10.1	63.4	9.5	59.8	(5.9)
Ontario	70.7	445.1	68.8	433.1	(2.7)
Quebec and Atlantic Provinces	42.1	264.9	30.6	192.2	(27.3)
Subtotal Canada excluding Alberta	143.4	902.1	129.3	813.6	(9.8)
U.S.A.	23.8	149.8	19.8	124.9	(16.8)
Total disposition^b	211.3	1 329.4	191.9	1 207.8	(9.2)

SOURCE: Alberta Energy Resources Conservation Board

^a Pentanes plus is a mixture mainly of pentanes and heavier hydrocarbons which ordinarily may contain some butanes and which is obtained from the processing of raw gas, crude oil, or condensate.

^b Includes losses and adjustments in interprovincial pipelines.

Table 8

Production and Disposition of Marketable Natural Gas

Calendar Year

	1980		1981		Percentage Change
	millions of cubic metres	billions of cubic feet	million cubic metres	billions of cubic feet	
Production	62 070.4	2 203.1	61 950.2	2 198.8	(0.2)
Disposition					
Alberta	13 464.8	477.9	13 361.8	474.3	(0.8)
Canada excluding Alberta:					
British Columbia	264.3	9.4	224.6	8.0	(15.0)
Saskatchewan and Manitoba	3 512.1	124.7	3 359.5	119.2	(4.3)
Ontario	18 037.5	640.2	19 009.2	674.7	5.4
Quebec	2 889.1	102.5	3 143.3	111.6	8.8
Subtotal Canada excluding Alberta	24 703.0	876.8	25 736.6	913.5	4.2
U.S.A.	19 355.6	687.0	18 433.8	654.3	(4.8)
Total disposition ^a	59 061.9	2 096.3	59 285.6	2 104.3	0.4

SOURCE: Alberta Energy Resources Conservation Board

^a Includes line fuel losses and metering differences in interprovincial pipelines

Table 9

Production of Marketable Coal

Calendar Year

	1980		1981		Percentage Change
	thousand tonnes	thousand short tons	thousand tonnes	thousand short tons	
Bituminous	7 326	8 076	6 825	7 523	(6.8)
Subbituminous	10 542	11 620	11 545	12 726	9.5
Total	17 868	19 696	18 370	20 249	2.8

SOURCE: Alberta Energy Resources Conservation Board

Table 10

Deliveries of Marketable Coal

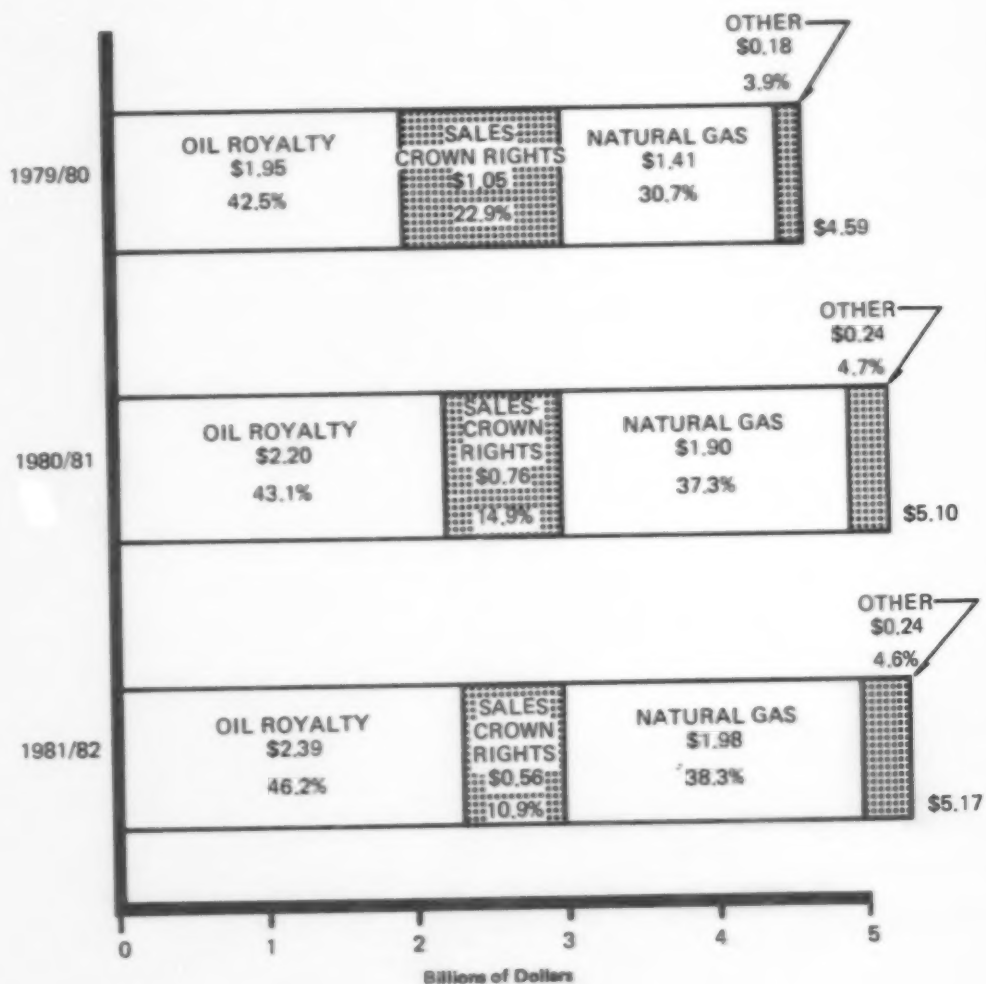
Calendar Year

	1980		1981		Percentage Change
	thousand tonnes	thousand short tons	thousand tonnes	thousand short tons	
Alberta	10 718	11 814	11 687	12 883	9.0
Canada excluding Alberta	1 861	2 051	1 957	2 157	5.2
Export	5 279	5 819	4 139	4 562	(21.6)
Total	17 858	19 684	17 783	19 602	(0.4)

SOURCE: Alberta Energy Resources Conservation Board

Chart 8

COMPARATIVE GROSS REVENUE
BY ENERGY SECTOR



	1979/80	1980/81	1981/82
Coal and Other Royalties	\$ 0.01	\$ 0.01	\$ 0.01
Rentals and Fees	0.07	0.09	0.09
Freehold Mineral Tax	0.10	0.14	0.14
	<u>\$ 0.18</u>	<u>\$ 0.24</u>	<u>\$ 0.24</u>

Source: Mineral Revenue Division

Chart 9
FREEHOLD MINERAL TAX REVENUES
1976/77 TO 1981/82

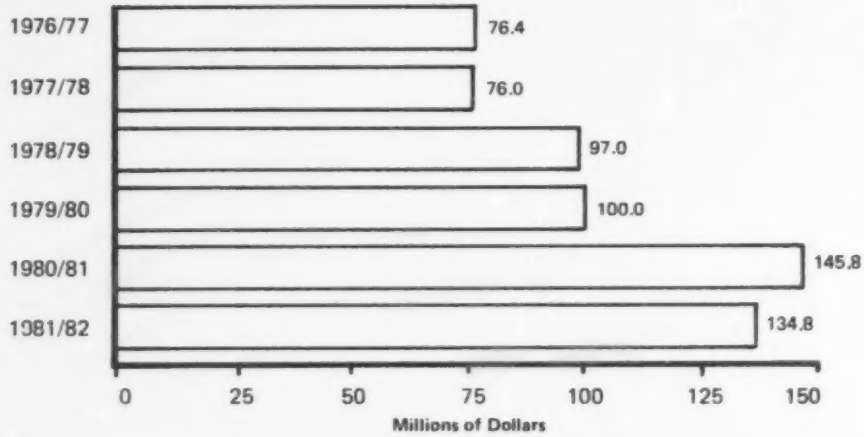
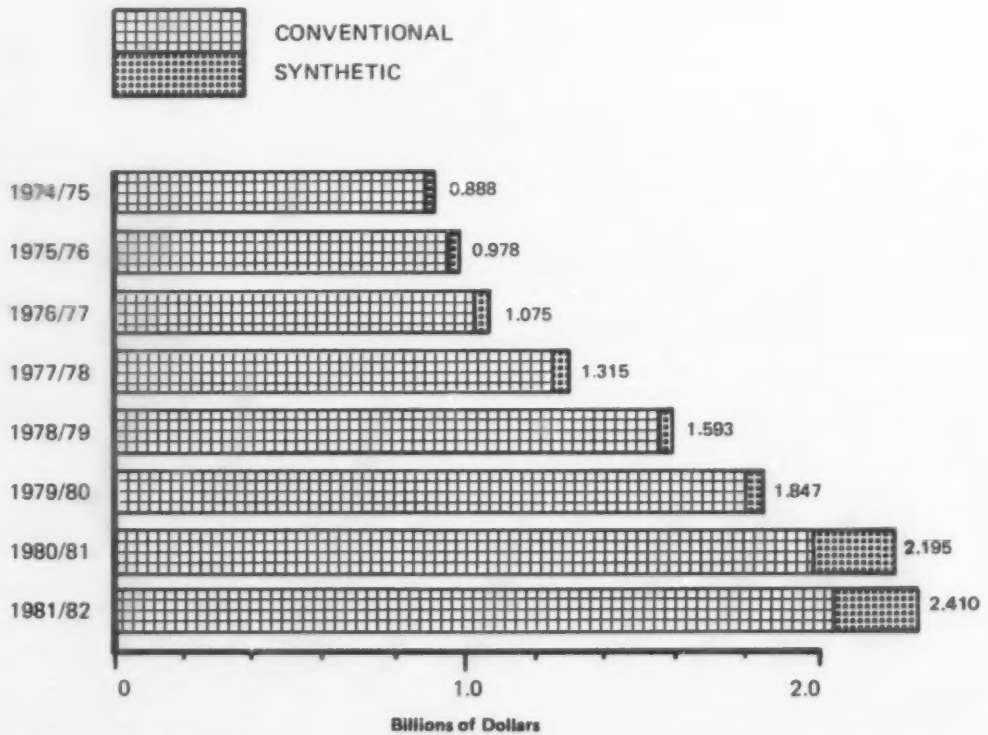


Chart 10
PETROLEUM ROYALTY REVENUES
1974/75 TO 1981/82



Source: Mineral Revenues Division

Chart 11
PETROLEUM ROYALTY INCENTIVES
1977/78 TO 1981/82

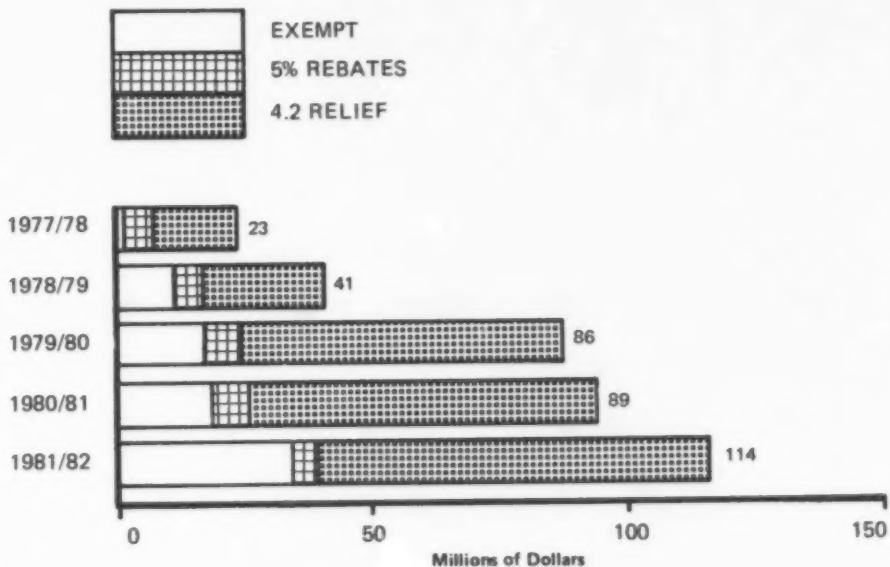
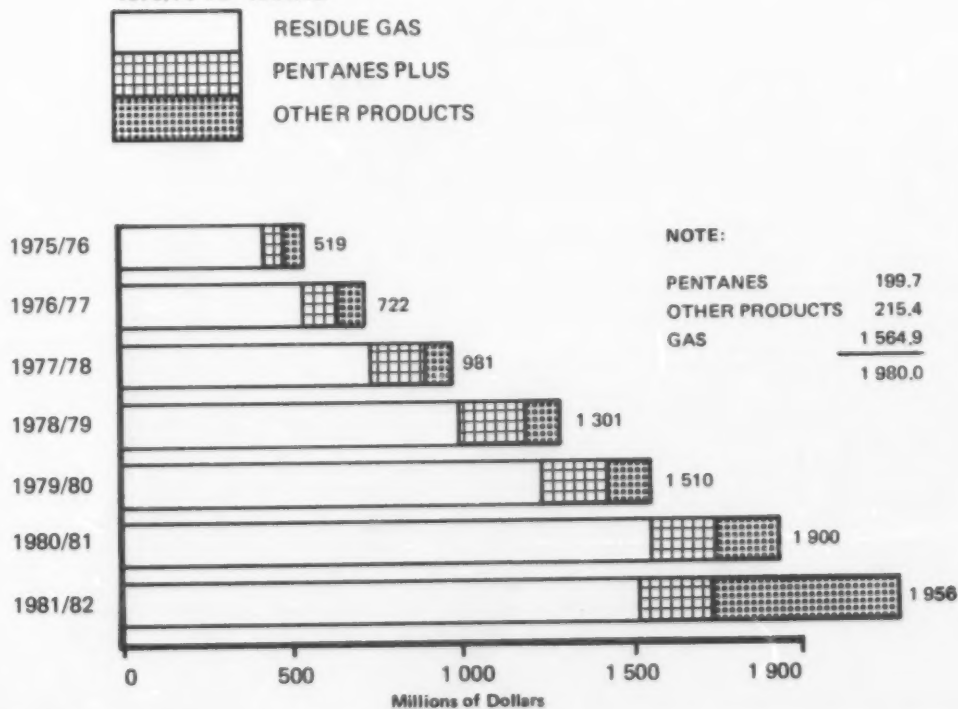


Chart 12
NATURAL GAS AND ASSOCIATED BY-PRODUCTS ROYALTIES
1975/76 TO 1981/82



Source: Mineral Revenue Division

Chart 13
COAL ROYALTY
1975/76 TO 1981/82

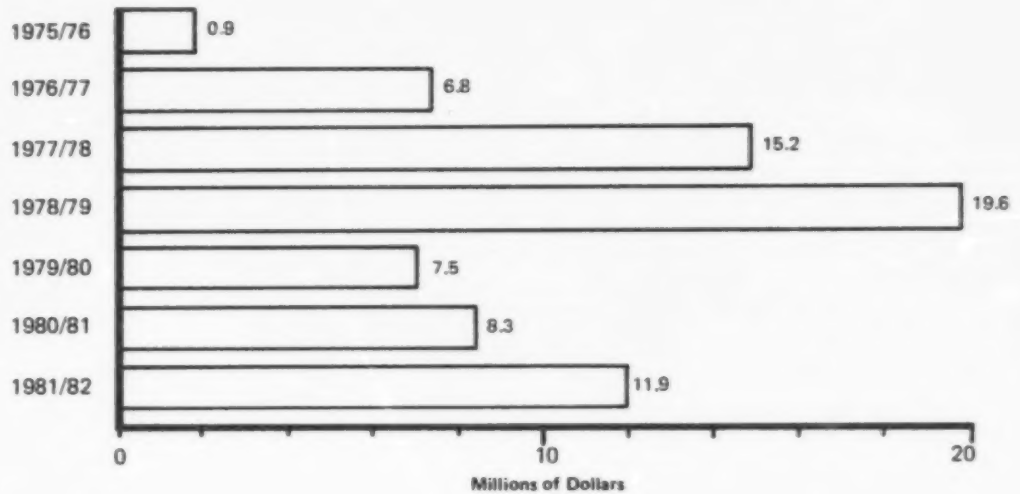
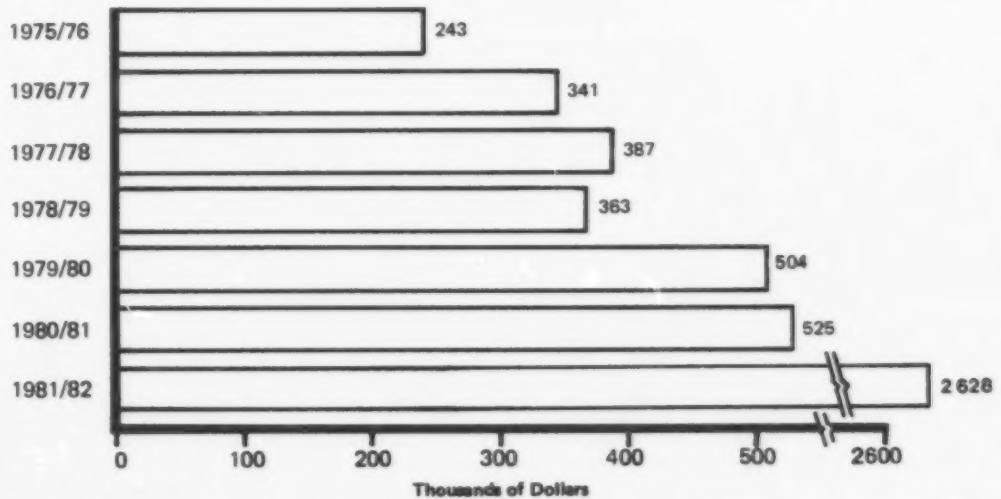


Chart 14
QUARRYING AND OTHER ROYALTIES
1975/76 TO 1981/82



Source: Mineral Revenues Division

Table 11

Area Acquired by Foreigners

By Month

	1977/78		1978/79		1979/80		1980/81		1981/82	
	hectares	acres	hectares	acres	hectares	acres	hectares	acres	hectares	acres
April	1 974	4 897	64	159	81	200	152	379	598	1 483
May	3 383	8 390	464	1 151	88	218	21	51	514	1 274
June	1 861	4 614	242	601	24	60	423	1 049	1 010	2 505
July	259	642	64	159	338	839	121	299	410	1 018
August	62	152	64	161	276	684	772	1 915	509	1 262
September	2 160	5 356	131	323	299	742	486	1 206	415	1 030
October	462	1 146	187	465	12	29	236	585	306	758
November	476	1 179	81	200	17	43	77	191	1 117	2 769
December	680	1 685	6	13	164	407	81	201	1 345	3 335
January	148	369	576	1 427	266	659	31	78	417	1 034
February	1 255	3 111	325	806	391	970	151	375	22	55
March	139	349	64	160	617	1 530	424	1 053	148	368
Total	12 859	31 890	2 268	5 625	2 573	6 381	2 975	7 382^a	6 811	16 891

SOURCE: Foreign Ownership of Land Administration

NOTE: Foreigners include ineligible persons and foreign controlled corporations as both are defined in the Foreign Ownership of Land Regulations.

^a Of this figure, 2 347 hectares (5 818 acres) were for estate settlement; 1 189 hectares (2 949 acres) under Order-in-Council which were mostly residential, industrial and resource development; 254 hectares (631 acres) for parcels under eight hectares (20 acres); 177 hectares (440 acres) because of agreements entered into prior to April 26, 1977; five hectares (12 acres) acquired under orders of foreclosure, 339 hectares (840 acres) because of a trust arrangement entered into prior to April 26, 1977; and 2 500 hectares (6 201 acres) for industrial and resource development, (not requiring an Order-in-Council e.g. petrochemical plants, etc.)

Table 12

Area Acquired by Foreigners Percentage of Total Rural Sales

	Foreign Sales		Total Rural Sales ^a		Percentage
	hectares	acres	hectares	acres	
1977/78	12 859	31 890	1 105 033	2 740 482	1.2
1978/79	2 268	5 625	1 227 996	3 045 430	0.2
1979/80	2 573	6 381	1 251 936	3 104 801	0.2
1980/81	2 975	7 382	1 150 787	2 853 953	0.2
1981/82	6 811	16 891	1 184 323	2 937 123	0.5

SOURCE: Foreign Ownership of Land Administration

NOTE: Foreigners include ineligible persons and foreign-controlled corporations as both are defined in the Foreign Ownership of Land Regulations.

^a Total Rural Sales include transfers only, whereas foreign sales include caveats for agreements for sale, options, etc.

Table 13

Area Acquired by Foreigners by Soil Class

1981/82

Soil Class	Hectares	Acres	Soil Class	Hectares	Acres
1	99	245	6	654	1 623
2	2 027	5 027	7	83	206
3	1 958	4 853	Organic	448	1 112
4	1 176	2 917	Total	6 811	16 891
5	366	908			

SOURCE: Foreign Ownership of Land Administration

NOTE: Foreigners include ineligible persons and foreign-controlled corporations as both are defined in the Foreign Ownership of Land Regulations.

Table 14

Area Acquired by Foreigners by Country

1981/82

Country	Hectares	Acres	Country	Hectares	Acres
United States	4 793	11 887	Kenya	8	21
Germany	254	631	West Indies	16	40
Italy	630	1 562	Ireland	321	795
Switzerland	11	28	Ghana	1	2
England	209	518	Mexico	8	19
Holland	105	260			
France	426	1 057	Total	6 811	16 891
India	29	71			

SOURCE: Foreign Ownership of Land Administration

NOTE: Foreigners include ineligible person and foreign controlled corporations as both are defined in the Foreign Ownership of Land Regulations.

Table 15

Area Acquired by Foreigners by Municipality

1981/82

	Hectares	Acres		Hectares	Acres
County			Improvement Districts		
1 Grande Prairie	12	30	2	37	94
2 Vulcan	280	695	7	56	141
3 Ponoka	74	183	10	2	5
5 Warner	225	559	13	1	1
7 Thorhild	563	1 395	14	121	299
8 Forty Mile	565	1 402	16	1	1
9 Beaver	124	307			
10 Wetaskiwin	65	160	Subtotal	218	541
11 Barrhead	10	25			
13 Smoky Lake	46	113			
14 Lacombe	696	1 726	Municipal Districts		
16 Wheatland	8	20	9 Pincher Creek	6	14
18 Paintearth	71	177	14 Taber	44	110
19 St. Paul	321	796	26 Willow Creek	259	642
20 Strathcona	574	1 424	31 Foothills	427	1 060
22 Camrose	16	37	34 Acadia	181	450
23 Red Deer	6	16	44 Rocky View	93	231
24 Vermilion	6	16	48 Kneehill	265	657
25 Leduc	16	37	61 Wainwright	129	320
26 Lethbridge	397	984	87 Bonnyville	69	171
27 Minburn	5	13	90 Sturgeon	571	1 417
29 Flagstaff	1	3	92 Westlock	66	163
30 Lamont	94	233			
31 Parkland	179	444	Subtotal	2 110	5 235
Subtotal	4 354	10 795	Total	6 811	16 891
Special Areas					
3 Oyen	129	320			
Subtotal	129	320			

SOURCE: Foreign Ownership of Land Administration

NOTE: Foreigners include ineligible persons and foreign controlled corporations as both are defined in the Foreign Ownership of Land Regulations.

Table 16

Assurance Fund Values for Foreign Purchases

1981/82

Month	Value of Total Rural Sales \$	Value of Foreign Sales \$	Percentage
April	200 406 075	1 085 707	0.54
May	213 171 451	4 186 739	1.96
June	201 803 556	3 279 879	1.63
July	153 823 701	2 718 000	1.77
August	129 206 276	12 289 849	9.51
September	143 773 503	3 602 436	2.51
October	142 590 307	3 257 101	2.28
November	115 564 999	11 013 974	9.53
December	78 362 437	5 399 396	6.89
January	165 401 013	4 743 234	2.87
February	168 956 404	449 900	0.27
March	195 829 313	2 361 650	1.21
Total	1 908 889 035	54 387 865	2.85

SOURCE: Foreign Ownership of Land Administration

Table 17

Area Acquired by Permanent Residents

1981/82

Country	Hectares	Acres	Value \$
Germany	8 681	21 529	26 756 286
United States	5 248	13 014	10 078 204
England	2 163	5 365	9 950 206
Holland	2 091	5 182	5 842 535
Denmark	1 734	4 301	3 577 779
Switzerland	770	1 910	1 782 261
Scotland	550	1 365	800 510
Italy	383	950	1 930 340
India	336	833	778 567
Australia	316	786	1 652 180
Sweden	310	770	646 999
Poland	284	705	487 400
New Zealand	259	639	607 767
Ireland	128	318	277 000
Columbia	127	316	67 000
South Africa	99	245	196 450
Austria	85	208	202 692
Mexico	78	194	206 667
Northern Ireland	69	170	123 000
Norway	66	165	29 000
Indonesia	62	153	125 000
Japan	50	124	251 500
Korea	42	104	78 333
Hungary	35	86	127 200
Venezuela	29	72	15 000
Trinidad	15	37	110 175
Wales	14	34	290 500
Jamaica	8	21	79 500
Czechoslovakia	5	12	119 000
Bermuda	4	11	49 272
Kenya	4	10	279 243
Panama	4	9	9 333
Portugal	3	8	56 900
Yugoslavia	3	7	72 500
Luxemburg	3	7	119 900
Spain	2	6	76 750
Finland	2	6	226 000
Fiji	2	4	24 900
Chile	1	3	47 250
Malaysia	1	3	21 500
Egypt	1	3	75 000
France	1	3	26 900
Other Countries	199	494	493 444
Total	24 267	60 182	68 767 943

SOURCE: Foreign Ownership of Land Administration

NOTE: Permanent resident means landed immigrant.

Table 18

Total Number of Land Agent Licences Issued

	Fiscal Year				
	77/78	78/79	79/80	80/81	81/82
April	25	22	33	55	40
May	27	36	38	32	43
June	24	33	22	68	39
July	12	30	26	19	22
August	19	25	25	32	25
September	17	20	23	37	34
October	21	15	25	55	32
November	14	23	26	13	31
December	13	19	28	13	41
January	20	24	34	23	12
February	19	70	31	21	39
March	33	19	22	35	32
Newly Issued	244	336	333	403	390
Renewed	55	440	174	142	517
Cancelled or Expired	111	671	320	232	324
Active	1 644	1 749	1 935	2 248	2 831

SOURCE: Foreign Ownership of Land Administration

Table 19

Photogrammetric Services Section

	1980/81	1981/82
Aerial Photography		
Number of projects completed	147	194
By Department	32 380 km ²	nil
By contract	257 995 km ²	310 052 km ²
Total area	290 375 km ²	310 052 km ²
Line distance flown		
By Department	8 917 km	nil
By contract	39 114 km	91 511 km
Total distance	48 031 km	91 511 km
Total number of photographs taken	19 608	26 273
Topographic Mapping		
Number of projects completed	30	34
Area mapped	4 545 km ²	10 920 km ²
Stereomodels mapped	216	508
Photogrammetric Map Control		
Aerial triangulation		
Phase III Forest Inventory	44 760 km ²	87 482 km ²
Base mapping	16 835 km ²	24 700 km ²
Total area	61 595 km ²	112 182 km ²
Mosaic Construction		
Number of projects completed	63	46
Area covered	19 287 km ²	36 623 km ²
Area Measurement	667 212 km ²	14 300 km ²

SOURCE: Resource Evaluation and Planning Division

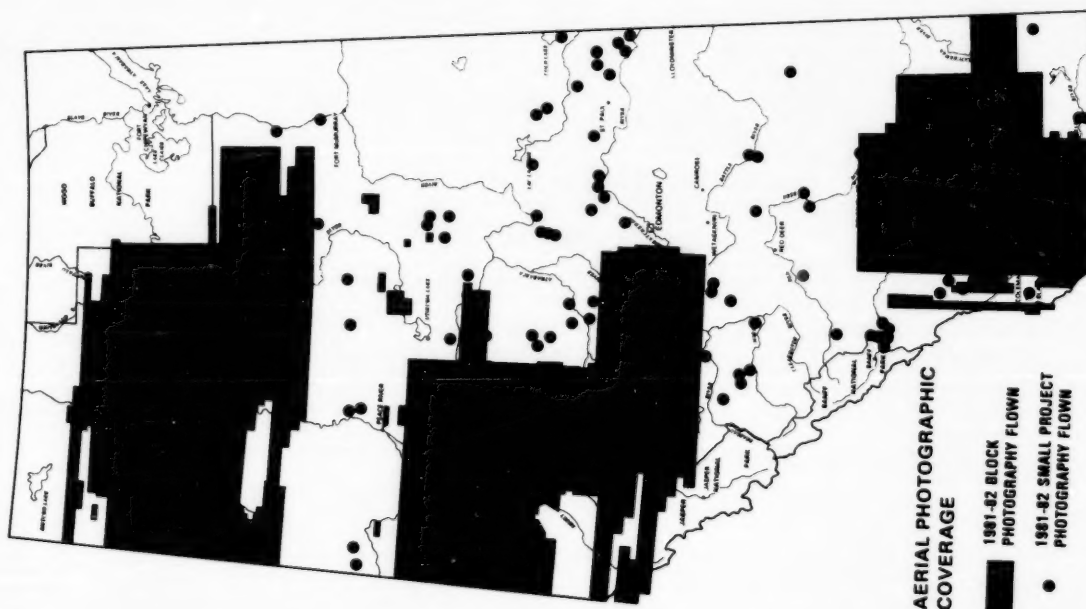
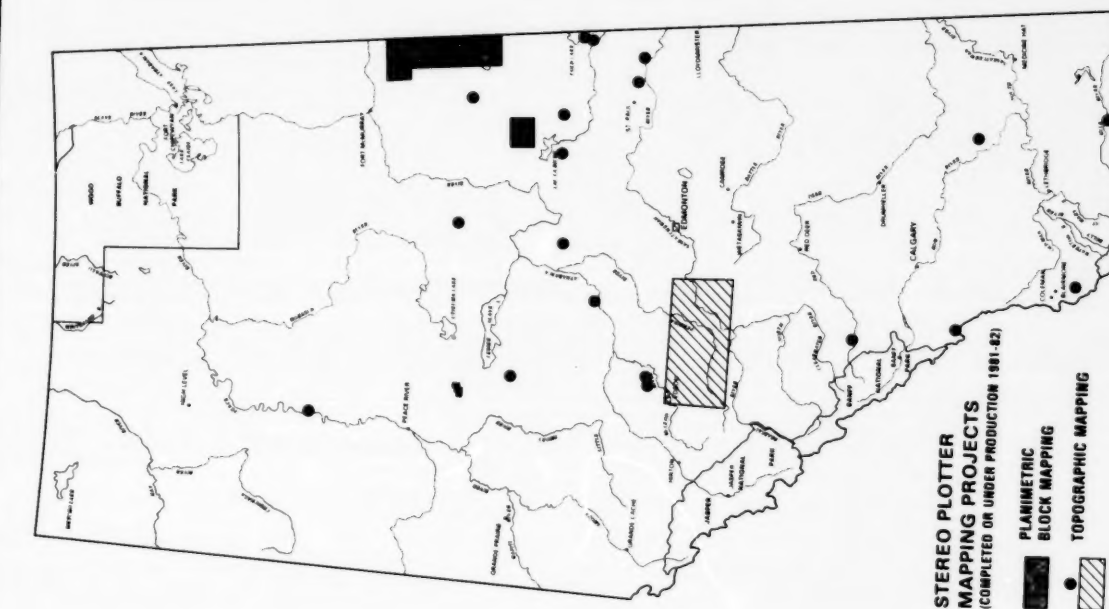
Table 20

Map and Air Photo Reproduction Statistics

Product	1980/81	1981/82
Contact prints (25.4 x 25.4 cm)	400 483	395 361
Enlargements (all sizes)	4 239	6 399
Diapositives	3 066	6 1 01
Itek prints	24 821	56 883
Aerial film processing	5 473 m	786 m
Graphics reproduction	6 553 m ²	8 725 m ²
Micro reduction	5 160 m	3 009 m
Micro duplicating	161 010 m	12 774 m
Diazo reproduction	107 734 m ²	115 160 m ²

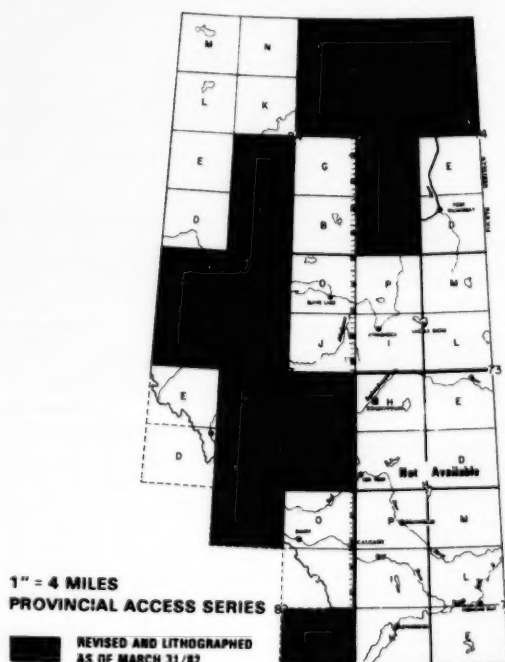
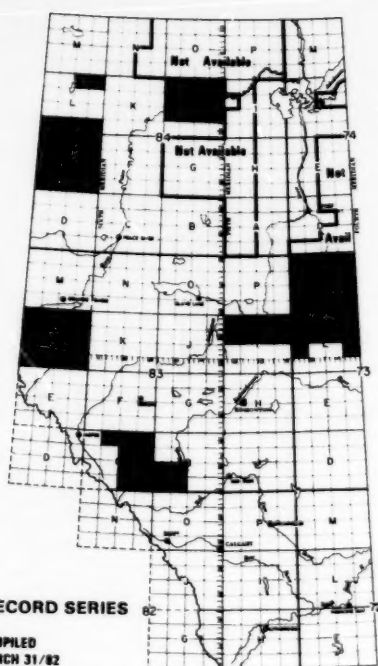
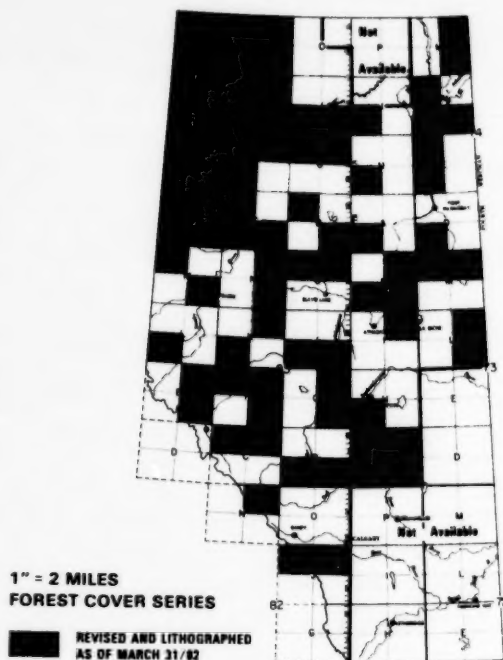
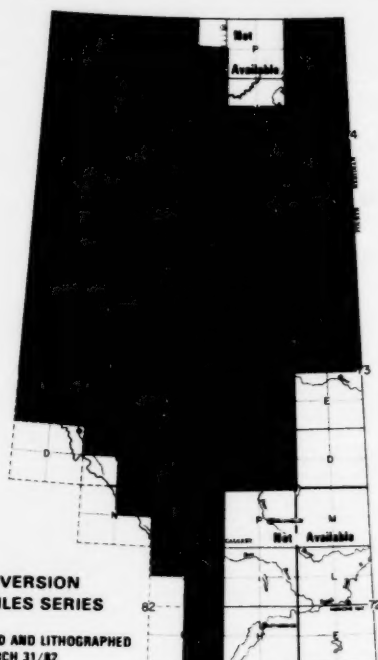
SOURCE: Resource Evaluation and Planning Division

Map Group 2



Source: Resource Evaluation and Planning Division

Map Group 3



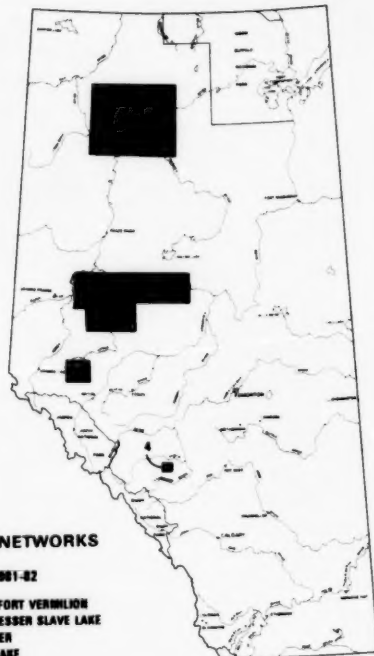
Source: Resource Evaluation and Planning Division

Map Group 4

CLIMATIC NETWORKS

OPERATED IN 1981-82

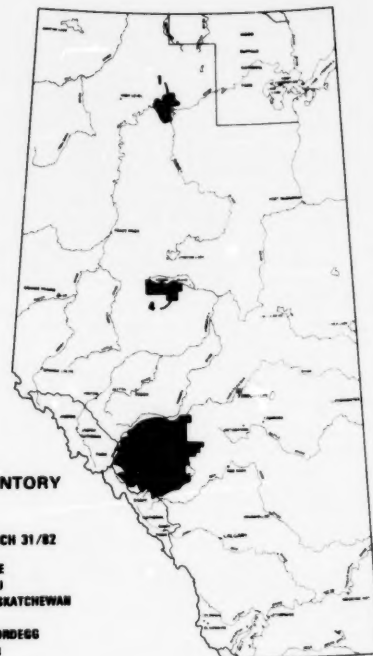
1. HIGH LEVEL-FORT VERMILION
2. STURDEON-LESSER SLAVE LAKE
3. MUSKEG RIVER
4. LANDSLIDE LAKE



FORAGE INVENTORY PROGRAM

COMPLETED TO MARCH 31/82

1. JEAN D'OR PRAIRIE
2. PEMBINA-BRAZEAU
3. ROCKY-NORTH SASKATCHEWAN
4. FROST HILLS
5. CHUNGO-CLINE-NORDEGG
6. RAM-CLEARWATER



PHYSICAL LAND CLASSIFICATION

COMPLETED 1981-82

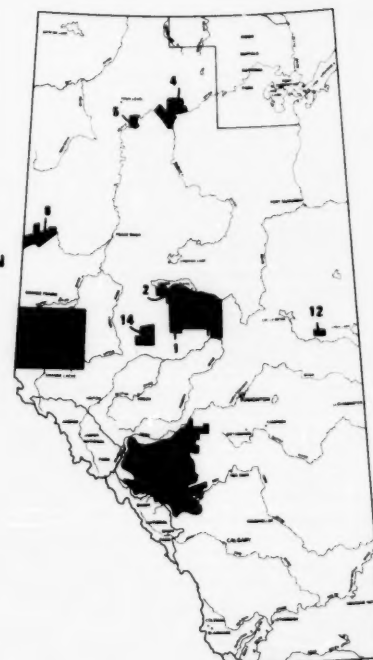
1. SWAN HILLS TOWNSITE
2. FROST HILLS
3. ROCKY-NORTH SASKATCHEWAN
4. JEAN D'OR PRAIRIE
5. LINTON LAKE
6. PEACE RIVER GRAZING LEASES

IN PROGRESS 1981-82

7. SWAN HILLS
8. B-S MANAGEMENT UNIT
9. CHUNGO-CLINE-NORDEGG
10. RAM-CLEARWATER
11. DEEP BASIN (B3 I)
12. LAKELAND
13. CLEARWATER RIVER WATERSHED

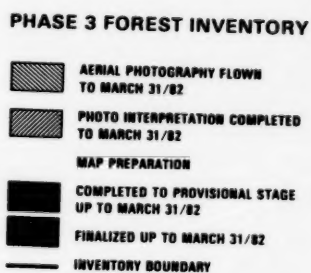
TERRAIN SENSITIVITY

14. VM MANAGEMENT UNIT
15. GRANDE PRAIRIE FOREST (B3 I Selected Areas)



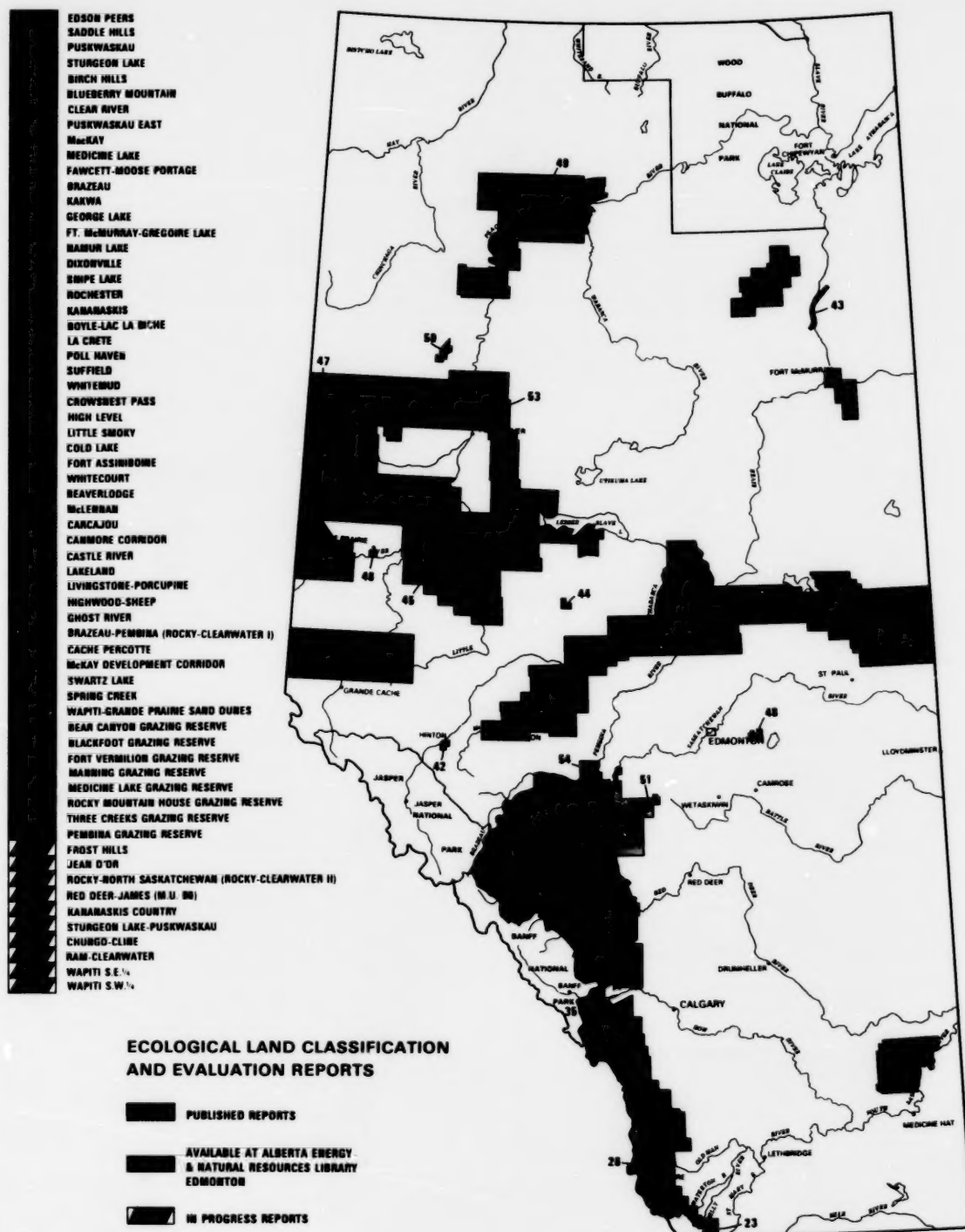
Source: Resource Evaluation and Planning Division

Map 5



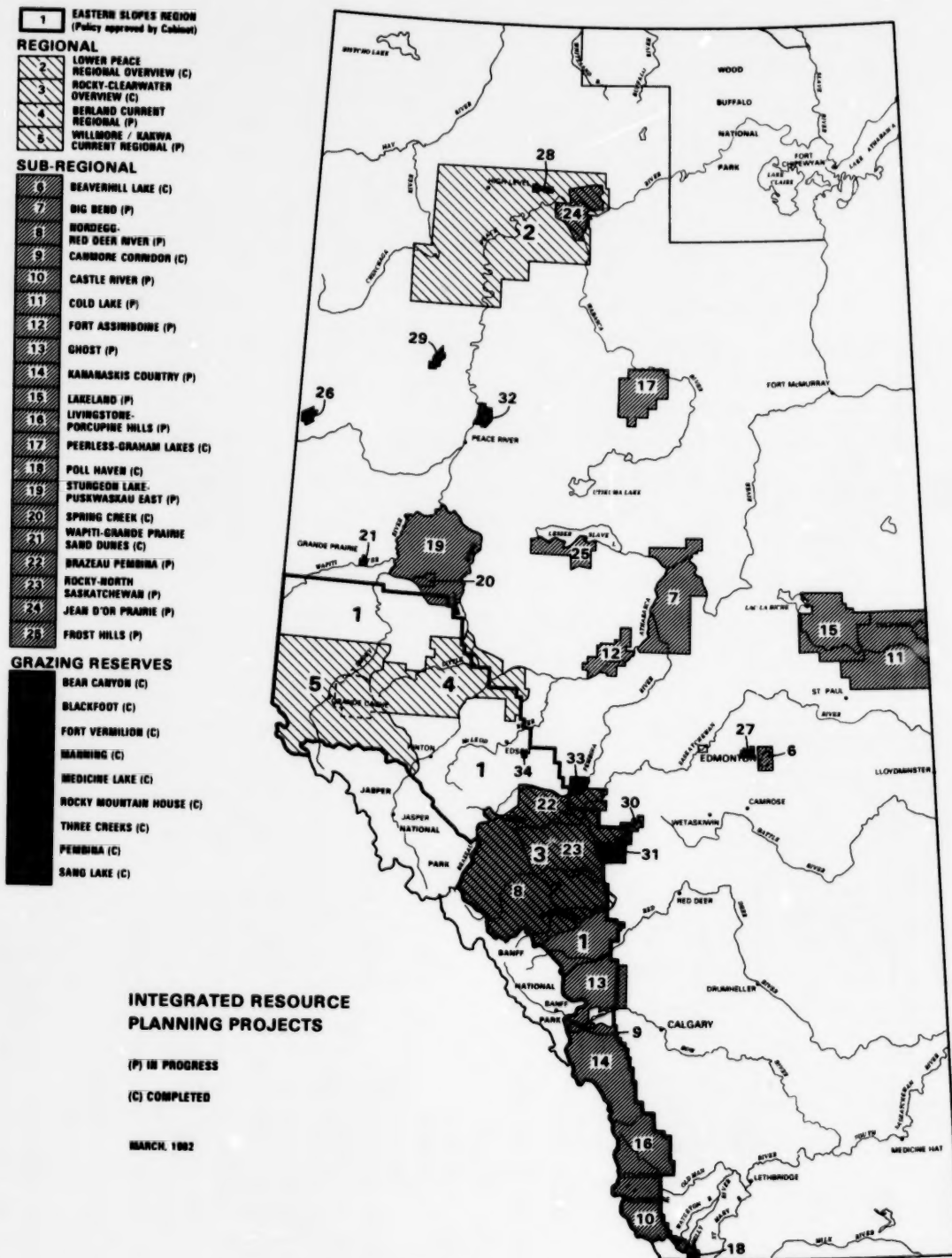
Source: Resource Evaluation and Planning Division

Map 6



Source: Resource Evaluation and Planning Division

Map 7



Source: Resource Evaluation and Planning Division

Table 21

Provisional Forest Fire Summary by Forest

Calendar Year

Class of Fire	Athabasca	Bow/Crow	Edson	Footner Lake	Grande Prairie	Lac La Biche	Peace River	Rocky/ Clearwater	Slave Lake	Whitcourt	Totals (\$)
A Spot - 0.10 Hectares	94	33	58	93	112	120	87	43	126	129	895
B 0.11 - 4.00 Hectares	78	4	15	101	30	97	36	4	76	39	480
C 4.10 - 40.00 Hectares	16	6	4	16	10	24	6	0	19	10	111
D 40.10 - 200.00 Hectares	4	0	1	6	3	8	6	0	5	1	34
E Over 200 Hectares	15	0	0	10	0	5	1	0	5	0	36
Cause of Fire											
Forest Industry	0	1	1	0	2	1	3	1	2	2	13
Other Industry	2	5	8	9	7	4	6	4	8	11	64
Recreation	2	23	9	22	19	46	14	30	20	18	203
Resident	8	2	7	29	29	20	30	3	18	14	160
Railroad	0	1	11	0	0	1	2	0	2	3	20
Lightning	181	2	32	133	78	146	64	6	137	105	884
Incendiary	2	1	3	13	7	24	6	0	14	2	72
Unknown	4	1	1	3	8	4	0	0	10	7	38
Other Known	8	7	6	17	5	8	11	3	20	17	102
Total Number of Fires	207	43	78	226	155	254	136	47	231	179	1 556
Total Areas Burned in Hectares	891 234	113	204	374 904	381	20 550	1 051	3	16 684	280	1 305 404
Fire Costs/Forest (\$1 000)	13 039	270	529	17 820	941	4 574	3 775	123	9 419	1 346	51 836
Protection Budget and Other Costs											22 198
Insect and Disease											1 926
Total Protection Expenditure											75 960

NOTE: Final Statistics were not available at the time of printing. More detailed and accurate tables will be included in the 1981-82 Alberta Forest Service Forest Statistics Review.

SOURCE: Alberta Forest Service

Table 22

Summary of AFS Recreation Developments

After 1981/82 Construction Season

Forest	Auto-Access Campgrounds	Camping Units	Day-use Units	Group Camps	Remote Campsites	Water Access Points	Trails km (miles)	Overflow Areas
Athabasca	3 --	71 --	43 --	-- --	6 --	-- --	35 (22)	-- --
Bow/Crow	24 --	1 299 --	440 --	14 --	4 --	-- --	899 (558)	1 --
Edson	14 --	423 --	185 --	2 --	-- --	-- --	378 (235)	-- --
Footner Lake	4 --	90 --	23 --	-- --	2 --	-- --	-- --	-- --
Grande Prairie	6 --	259 --	50 --	1 --	2 --	-- --	5 (3)	-- --
Lac La Biche	7 --	273 --	32 --	-- --	1 --	-- --	-- --	-- --
Peace River	4 --	79 --	43 --	1 --	-- --	-- --	-- --	-- --
Rocky/Clearwater	24 --	683 --	183 --	7 --	2 --	4 --	192 (119)	2 --
Slave Lake	4 --	121 --	55 --	-- --	-- --	1 --	-- --	-- --
Whitecourt	6 --	157 --	31 --	1 --	-- --	-- --	5 (3)	-- --
Total	96 --	3 455 --	1 085 --	26 --	17 --	5 --	1 514 (940)	3 --

SOURCE: Alberta Forest Service

Table 23

Reforestation Surveys Alberta Forest Service

1981/82

Forest	Regeneration Survey						Post Harvest Survey	
	Stocked		Non-stocked		Total			
	hectares	acres	hectares	acres	hectares	acres	hectares	acres
Athabasca	354	874	338	835	692	1 709	279	689
Bow/Crow	1 252	3 091	480	1 185	1 732	4 277	190	469
Edson	149	368	312	770	462	1 141	—	—
Footner Lake	2 274	5 615	599	1 479	2 873	7 094	—	—
Grande Prairie	1 050	2 593	165	404	1 215	3 000	323	798
Lac La Biche	646	1 595	40	99	686	1 694	184	454
Peace River	546	1 348	47	116	594	1 467	885	2 185
Rocky/Clearwater	745	1 840	407	1 005	1 152	2 844	426	1 052
Slave Lake	2 182	5 388	416	1 027	2 598	6 415	2 360	5 827
Whitecourt	503	1 242	70	173	573	1 415	1 021	2 521
Total	9 701	23 954	2 874	7 093	12 577	31 056	5 668	13 995

SOURCE: Alberta Forest Service

Table 24

Reforestation Work by Alberta Forest Service

1981/82

Forest	Site Preparation		Seeding hectares (acres)	Cone Collection				Seedling Planting			Thinning hectares (acres)
	Mechanical hectares (acres)	Chemical hectares (acres)		Pine hecto- litres (bushels)	Spruce hecto- litres (bushels)	CONVENTIONAL		CONTAINER			
						hectares (acres)	number	hectares (acres)	number		
Athabasca	114 (282)	-- --	-- --	7 (19)	-- --	154 (380)	225 859 --	350 (864)	478 294 --	-- --	
Bow/Crow	1 266 (3 126)	-- --	448 (1 106)	1 231 (3 385)	-- --	443 (1 094)	561 282 --	-- --	-- --	-- --	
Edson	386 (953)	-- --	-- --	7 (19)	-- --	330 (815)	541 274 --	-- --	-- --	229 (566)	
Footner Lake	668 (1 649)	-- --	-- --	-- --	-- --	462 (1 141)	772 075 --	-- --	-- --	-- --	
Grande Prairie	336 (830)	-- --	733 (1 810)	2 090 (5 748)	-- --	450 (1 111)	553 580 --	105 (259)	178 200 --	-- --	
Lac La Biche	-- --	-- --	-- --	-- --	-- --	404 (998)	668 579 --	71 (175)	115 958 --	-- --	
Peace River	136 (336)	-- --	-- --	-- --	-- --	341 (842)	372 300 --	54 (133)	69 486 --	-- --	
Rocky/ Clearwater	992 (2 449)	-- --	324 (800)	529 (1 455)	-- --	180 (444)	222 200 --	42 (104)	52 770 --	22 (54)	
Slave Lake	1 399 (3 454)	-- --	1 622 (4 005)	-- --	-- --	1 046 (2 583)	1 741 535 --	360 (889)	612 355 --	-- --	
Whitecourt	667 (1 647)	-- --	-- --	-- --	-- --	211 (521)	282 465 --	492 (1 215)	739 624 --	-- --	
Total	5 964 (14 726)	-- --	3 127 (7 721)	3 864 (10 626)	-- --	4 021 (9 929)	5 941 149 --	1 474 (3 639)	2 246 687 --	251 (620)	

SOURCE: Alberta Forest Service

Table 25
Maintaining Our Forests
Reforestation Work Program by Forest Activity
1981/82

	Stocking Surveys			Site Preparation			Planting				Cone Collection		Thinning
	Aerial Recon. hectares (acres)	Ground Recon. hectares (acres)	Ground Intensive hectares (acres)	Land Clearing hectares (acres)	Mechanical Scarification hectares (acres)	Chemical hectares (acres)	CONVENTIONAL		CONTAINER		Pine hecto- litres (bushels)	Spruce hecto- litres (bushels)	
							Area hectares (acres)	Number of Trees	Area hectares (acres)	Number of Trees			
Footner Lake	-- --	-- --	3 664 (9 047)	2 342 (10 721)	506 (1 249)	100 (247)	-- --	-- --	697 (1 721)	1 478 237 --	-- --	-- --	-- --
Lac La Biche	12 011 (29 657)	2 582 (6 375)	571 (1 410)	2 217 (5 474)	1 628 (4 020)	-- --	-- --	-- --	284 (701)	490 142 --	-- --	-- --	-- --
Peace River	9 550 (23 580)	12 000 (29 630)	207 (511)	4 124 (10 183)	1 757 (4 338)	84 (207)	-- --	-- --	659 (1 627)	1 030 414 --	-- --	-- --	-- --
Slave Lake	10 131 (25 015)	-- --	6 721 (16 595)	3 102 (7 659)	1 262 (3 116)	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Rocky/ Clearwater	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	149 (368)
Total	31 692 (78 252)	14 582 (36 005)	11 163 (27 563)	11 785 (34 037)	5 153 (12 723)	184 (454)	-- --	-- --	1 640 (4 049)	2 998 793 --	-- --	-- --	149 (368)

SOURCES: Alberta Forest Service

Table 26

Pine Ridge Forest Nursery Seed Program

1981/82

	Cones Received		Cones Processed		Seed Cleaning		Seed Storage	
	hectolitres	bushels	hectolitres	bushels	kilograms	pounds	kilograms	pounds
1981/82	Pine							
	5 458	15 010	6 056	16 654	1 589	4 370	8 293	22 806
	Spruce							
1981/82	3.3	9	3.3	9	1.3	3.6	28 415	78 141

SOURCE: Alberta Forest Service

Table 27

Pine Ridge Nursery Bareroot and Container Seedling Programs

1981/82

	1981/82		
	Pine	Spruce	Total
Bareroot Program			
Seedling Inventory:			
age 0 - 1.0 year	700 000	17 310 000	18 010 000
age 1.0 - 2.0 years	1 436	9 301 500	9 302 936
age 2.0 - 3.0 years	1 599 900	11 290 800	12 890 700
Seedling lifted	1 237 555	7 769 855	9 007 410
Seedling shipped	474 225	5 713 278	6 187 503
Container Program			
Seedlings grown	255 800	13 044 438	13 300 238
Seedlings shipped	951 961	7 749 229	8 701 190

SOURCE: Alberta Forest Service

Table 28

Timber Operations on Public Lands - Volume of Production

1981/82

	Forest Management Agreements Timber Licences, Commercial Permits	Local Timber Permits, Tree Tags	Total
Active timber dispositions	417	41 707	42 124
Lumber and plywood logs:			
Coniferous	3 882 543 m ³ (137 112 006 cu. ft.)	613 534 m ³ (21 666 953 cu. ft.)	4 496 077 m ³ (158 778 959 cu. ft.)
Deciduous	115 054 m ³ (4 063 132 cu. ft.)	16 652 m ³ (588 065 cu. ft.)	131 706 m ³ (4 651 197 cu. ft.)
Round timber:			
Coniferous	43 546 m ³ (1 537 827 cu. ft.)	284 343 m ³ (10 041 573 cu. ft.)	327 889 m ³ (11 579 400 cu. ft.)
Deciduous	6 m ³ (212 cu. ft.)	10 670 m ³ (376 811 cu. ft.)	10 676 m ³ (377 023 cu. ft.)
Pulpwood:			
Coniferous	1 488 837 m ³ (52 578 278 cu. ft.)	153 m ³ (5 403 cu. ft.)	1 488 990 m ³ (52 583 681 cu. ft.)
Deciduous	-- --	34 m ³ (1 201 cu. ft.)	34 m ³ (1 201 cu. ft.)
Wood chips:	859 625 m ³ (303 577 BDU)*	-- --	859 625 m ³ (303 577 BDU)*
Fuelwood:			
Coniferous	2 342 m ³ (82 708 cu. ft.)	25 930 m ³ (915 718 cu. ft.)	28 272 m ³ (998 426 cu. ft.)
Deciduous	90 m ³ (3 178 cu. ft.)	22 529 m ³ (795 612 cu. ft.)	22 619 m ³ (798 790 cu. ft.)
Slabs:	237 m ³ (8 370 cu. ft.)	-- --	237 m ³ (8 370 cu. ft.)
Railway ties:	17 728 m ³ (626 064 cu. ft.)	89 m ³ (3 143 cu. ft.)	17 817 m ³ (629 207 cu. ft.)
Lath: (50 pieces per bundle)	-- --	220 m ³ (7 769 cu. ft.)	220 m ³ (7 769 cu. ft.)
Total:	6 410 008 m ³ (196 011 775 cu. ft.)**	974 154 m ³ (34 402 248 cu. ft.)	7 384 162 m ³ (230 414 023 cu. ft.)**
Trees:			
Christmas	675	46 601	47 276
Transplants	--	47 245	47 245

SOURCE: Alberta Forest Service

NOTE: Production on other Crown lands not included in the above:

Metis Colonies 2 641 m³ (93 267 cu. ft.)Federal Parks 60 193 m³ (2 122 537 cu. ft.)

* Bone Dry Units

**Does not include Wood chips (BDU)

Table 29

Timber Operations on Public Lands - Value of Production

1981/82

	Volume Produced	Unit Price \$	Value \$
Lumber and plywood logs:			
Coniferous	4 496 077 m ³ (158 778 959 cu. ft.)	40.81 (1.16)	183 484 902
Deciduous	131 706 m ³ (4 651 197 cu. ft.)	27.96 (0.79)	3 682 500
Round timber:			
Coniferous	327 889 m ³ (11 579 400 cu. ft.)	79.50 (2.25)	26 067 176
Deciduous	10 676 m ³ (377 023 cu. ft.)	79.50 (2.25)	848 742
Pulpwood:			
Coniferous	1 488 990 m ³ (52 583 681 cu. ft.)	16.62 (0.47)	24 747 014
Deciduous	34 m ³ (1 201 cu. ft.)	16.62 (0.47)	565
Wood chips:	859 625 m ³ (303 577 BDU)*	11.43 (32.38)	9 825 514
Fuelwood:			
Coniferous	28 272 m ³ (998 426 cu. ft.)	20.77 (0.59)	587 209
Deciduous	22 619 m ³ (798 790 cu. ft.)	20.77 (0.59)	469 797
Slabs:	237 m ³ (8 370 cu. ft.)	20.77 (0.59)	4 922
Railway ties	17 817 m ³ (629 207 cu. ft.)	64.41 (1.82)	1 147 593
Lath: (50 pieces per bundle)	220 m ³ (7 769 cu. ft.)	454.55 (12.87)	100 001
Sub Total	7 384 162 m ³ (230 414 023 cu. ft.)**		250 965 935
Trees:			
Christmas	47 276 pieces	3.00	141 828
Transplants	47 245 pieces	2.00	94 490
Total value of production			251 202 253

SOURCE: Alberta Forest Service

* Bone Dry Units (BDU)

** Does not include Wood chips (BDU)

Table 30

Timber Dispositions Issued

1981/82

Class	Number Issued	Class	Number Issued
Coniferous timber quota	0	Local timber permits	2 078
Deciduous timber allocations (DTA)	5	Tree tags	39 629
Licences:		Customer sawmill, planer mill or timber treating or processing plant permits	38
Coniferous quota	24		
Deciduous, DTA	1		
Commercial timber permits:			
Coniferous - green	3		
Coniferous - dead or damaged	16		
Deciduous - green	7		

SOURCE: Alberta Forest Service

Table 31

Status of Lands in Alberta

March 31, 1982

	Area		Percentage of Alberta
	square kilometres	square miles	
Privately-owned land	181 081	69 916	27.4
Public lands			
Under disposition leading to title	2 945	1 137	0.4
Under disposition not leading to title	28 772	11 109	4.4
Special areas	14 147	5 462	2.1
Parks, historic sites, wilderness areas, natural areas	7 840	3 027	1.2
Metis settlements	5 053	1 951	0.8
Indian reserves	6 568	2 536	1.0
Non-settled public lands			
Forested lands within the Green Area ^a	264 184	102 002	40.0
Forest management agreement areas and provisional reserve	72 367	27 941	10.9
Vacant public land (within Yellow and White Areas ^b)	15 183	5 862	2.3
Federally-controlled lands (national parks, research stations, Department of National Defense, etc.)	63 045	24 342	9.5
Total area of Alberta	661 185	255 285	100.0
Land	644 389	248 800	97.5
Water	16 796	6 485	2.5

SOURCE: Public Lands Division

^a Green Area: Forested lands withdrawn from settlement, managed for forestry and other multiple uses.^b Yellow Area: Lands located in the Peace River region. Public lands in this area are managed for multiple use, including agricultural uses, pursuant to the Public Lands Act and regulations.

White Area: The settled area of the province. Suitable public lands within this area may be disposed pursuant to the Public Lands Act and regulations, except for homestead sale dispositions.

Table 32

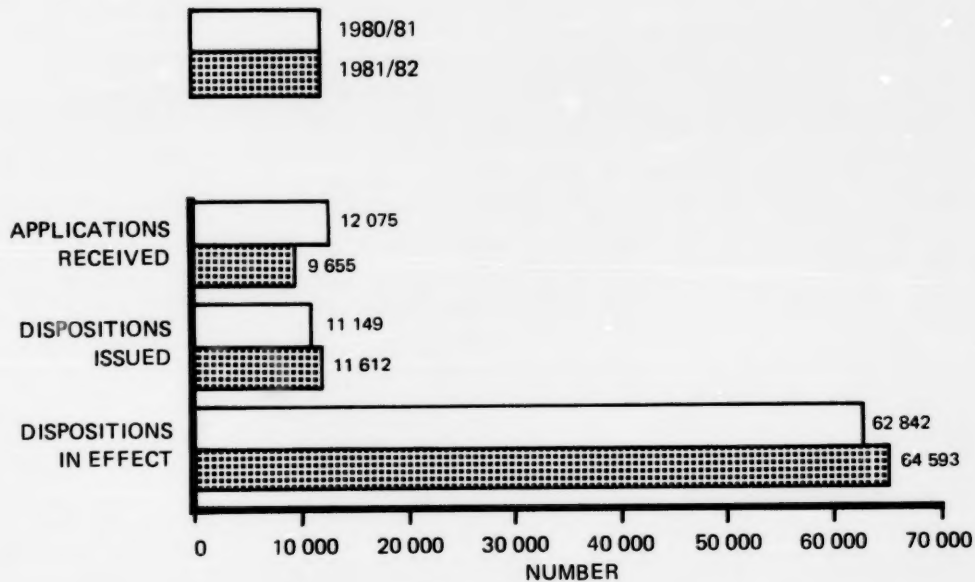
Applications For Public Lands

	Number Received			Number Received	
	1980/81	1981/82		1980/81	1981/82
Cultivation permits	118	117	Miscellaneous leases	175	144
Farm development leases	864	596	Miscellaneous leases (subdivision lots)	555	121
Farm development sales	684	614	Miscellaneous permits	569	594
Forest grazing licences	33	29	Oil sands exploration	15	--
Grazing leases	865	734	Pipeline agreements	928	779
Grazing permits	1 098	1 005	Pipeline installation leases	61	72
Homestead sales	464	524	Recreational leases	31	41
Public land sales	160	107	Surface material leases	149	72
Coal exploration	64	56	Surface material licences	917	698
Easements	197	258	Total	12 075	9 655
Licence of occupation	1 740	1 317			
Mineral surface leases	2 388	1 777			

SOURCE: Public Lands Division

Chart 15

ACTIVITY IN PUBLIC LANDS
APPLICATIONS AND DISPOSITIONS



Source: Public Lands Division

Table 33

Public Lands Disposition Statistics

DISPOSITIONS IN EFFECT	1981/82		1980/81	
	number	hectares	number	hectares
Dispositions leading to title				
Agricultural dispositions:				
Agricultural farm sales	281	24 602	336	28 787
Farm development sales	964	95 952	945	94 269
Homestead sales, leases	1 366	170 267	1 593	192 862
Public land sales	61	3 815	77	4 426
Total	2 672	294 636	2 941	320 344
Non-agricultural dispositions:				
Public land sales ^a	72		75	
Total		83.5 lots		88.5 lots
Dispositions not leading to title				
Agricultural dispositions:				
Cultivation leases	117		54	
Cultivation permits	1 458	2 404	118	5 105
Farm development leases	54	143 311	1 347	2 755
Forest grazing licences	5 367	19 829	42	130 084
Grazing leases	913	2 165 438	5 250	17 360
Grazing permits	3	122 779	994	2 152 652
Seed crop leases		3 846	3	126 815
Total	7 912	2 457 607	7 808	3 846
Non-Agricultural dispositions (special uses)				
Alberta Housing Corporation:				
Metis leases	7	24	7	24
Mineral surface leases	16 025	71 847	14 797	69 334
Miscellaneous leases	499	21 448	469	21 312
Pipeline agreement leases	8 778	39 400	8 026	36 589
Pipeline installation leases	492	483	454	418
Recreational leases	273	7 086	259	6 610
Sand and gravel leases ^b , surface material leases	416	5 770	396	5 548
Staff housing land licences	16	6	16	6
Total	26 506	146 064	24 424	139 841
Total		360 653		6 021 278
Total				345 286

DISPOSITIONS IN EFFECT	1981/82			1980/81		
	number	hectares	acres	number	hectares	acres
'D' Reservations	1 741			1 647		
Easements	3 620		area	3 564		area
Licence of occupation	7 756			6 559		
Miscellaneous permits	594		not	569		not
Miscellaneous leases	645		available	634		available
(subdivision lots)						
Surface materials licences	698			917		
Right of entry	5 449			5 459		
Total	20 503			19 349		
Letters of authority (equivalent to a disposition)	6 928	--	--	8 245	--	--
Notification for title and title transfers						
Farm development sales ^e	174	15 573	38 453	227	20 309	50 144
Homestead dispositions	273	28 753	70 995	305	34 042	84 054
Other sales	36	1 123	2 772	89	1 226	3 028
Transfers of administration and control	27	3 419	8 442	15	47	116
Exchange of land	16	989	2 442	26	1 934	4 776
Special grants and free grants	5	224	554	1	65	160
Lots — Notifications	28	--	--	45	--	--
— Transfer of Admin. & Control	13	--	--	--	--	--
Total	572	50 081	123 658	708	57 623	142 278
Lands acquired by reversion ^d						
Exchange of land	47	1 307	3 226	29	1 515	3 741
Purchased under land assembly	155	3 480	8 592	276	11 249	27 775
Purchased under land assembly	--	--	--	4 lots	--	--
From Canada (P.F.R.A.)						
Canal rights-of-way	38	200	494	67	224	553
From Municipal Affairs	--	--	--	1	--	1
From Transportation	--	--	--	10	27	66
Other	46	398	983	13	97	240
Total	286	5 385	13 295	400	13 112	32 376

DISPOSITIONS IN EFFECT	1981/82			1980/81		
	number	hectares	acres	number	hectares	acres
Other Transactions						
Notifications to Minister (pseudo revestment)	190	10 170	25 110	191	9 920	24 495
Notifications to Minister (pseudo revestment)	--	--	--	1 lot	--	--
Private subdivisions checked to determine if public lands affected						
Subdivision applications checked	1 155	--	--	1 187	--	--
Subdivision plans approved	175	--	--	198	--	--
Total	1 330	--	--	1 385	--	--
Number of survey plans approved and indexed	2 062	--	--	3 809	--	--
Survey of public lands						
Quarter sections	175	--	--	--	--	--
Lots	8	--	--	--	--	--
Posting of public lands						
Quarter sections	1 821	--	--	1 907	--	--
Subdivision lots	--	--	--	50	--	--

SOURCE: Public Lands Division

^a Includes sales for industrial, residential, recreational and commercial purposes.

^b Commencing Jan. 11, 1978, issuing of these dispositions was discontinued. They were replaced by surface material leases.

^c Including farm development sales, agricultural farm sales.

^d Statistics in the number columns are the number of quarter sections or part thereof.

Table 34

Land Area and Utilization of Provincial Grazing Reserves

1981/82

Grazing Reserve	Total Area		Developed Area ^a		AUMs ^b Utilized number	Number of Patrons
	hectares	acres	hectares	acres		
Bear Canyon ^c	8 376	20 681	3 872	9 561	1 091	9
Blueberry Mountain ^c	3 768	9 304	1 996	4 928	2 267	16
Kleskun Lake	5 308	13 107	2 451	6 053	10 971	98
Valleyview	5 305	13 100	2 929	7 233	1 981	21
Wanham	7 588	18 735	5 277	13 029	7 840	57
Total Grande Prairie Reserves	30 345	74 927	16 525	40 804	24 150	201
Fort Vermilion ^c	7 786	19 226	1 959	4 836	1 565	6
High Prairie ^c	11 423	28 204	3 547	8 759	759	7
Manning ^c	4 018	9 920	1 816	4 483	---	---
Three Creeks ^c	16 009	39 529	2 225	5 493	---	---
Whitemud	9 578	23 650	4 484	11 071	6 485	38
Total Peace River Reserves	48 814	120 529	14 031	34 642	8 809	51
Black Bear	6 916	17 078	4 352	10 745	8 983	65
Connor Creek	13 897	34 313	6 480	16 000	15 875	89
Thorhild	7 025	17 346	3 532	8 720	9 227	53
Total Edmonton Reserves	27 838	68 737	14 364	35 465	34 085	207
Buck Mountain	6 931	17 114	3 630	8 964	14 497	92
Jack Pine	5 152	12 722	2 422	5 981	8 043	45
Medicine Lake	6 606	16 311	2 932	7 240	7 658	58
Pembina ^c	7 912	19 537	---	---	---	---
Rocky Mountain House ^c	6 416	15 842	---	---	---	---
Sang Lake ^c	1 215	3 000	---	---	---	---
Total West-Central Reserves	34 232	84 526	8 984	22 185	30 198	195
Minburn	5 478	13 527	3 037	7 500	6 777	68
Rannach	7 641	18 866	5 780	14 271	8 697	62
Smoky Lake	3 818	9 427	1 813	4 477	2 581	17
St. Paul	9 586	23 669	6 230	15 382	7 321	45
Wolf Lake	11 296	27 892	3 782	9 339	3 015	24
Total St. Paul Reserves	37 819	93 381	20 642	50 969	28 391	216

	Total Area		Developed Area ^a		AUMs ^b Utilized number	Number of Patrons
	hectares	acres	hectares	acres		
Grazing Reserve						
Hays	2 772	6 845	193	476	1 170	20
Lonesome Lake	4 757	11 745	3 503	8 650	9 513	71
Purple Springs	2 224	5 492	648	1 600	4 899	55
Twin River	13 431	33 163	—	—	7 648	62
Total Lethbridge Reserves	23 184	57 245	4 344	10 726	23 230	208
Bow Island	15 806	39 028	3 171	7 830	10 308	70
Seven Persons	2 685	6 630	666	1 645	4 433	57
Pinhorn	30 923	76 353	—	—	10 200	78
Sage Creek	30 937	76 388	—	—	7 782	52
Total Medicine Hat Reserves	80 351	198 399	3 837	9 475	32 723	257
Provincial Total	282 583	697 744	82 727	204 266	181 586	1 335

SOURCE: Public Lands Division

^a Area cleared, worked down, and seeded.

^b An AUM (Animal Unit Month) is forage provided for one animal unit (one mature cow with calf or their equivalent) for one month. Statistics include sheep and horses.

^c Grazing reserves not yet operational.

Table 35

New Development on Provincial Grazing Reserves

As of March 31/82

Uni

Grazing Reserve	Area Developed or Improved hectares (acres)								Kilo- metres (miles) Fenced	Number of Dugouts
	Cleared and Piled	Burned ^a	Replied ^a	Broken	Worked Down	Seeded	Aerial Sprayed	Fertilized		
Bear Canyon ^b	-- --	2 286 (5 645)	803 (1 983)	350 (863)	1 641 (4 051)	1 667 (4 116)	-- --	1 620 (4 000)	-- --	11 --
Blueberry Mountain ^b	-- --	-- --	1 175 (2 900)	-- --	-- --	-- --	-- --	1 823 (4 500)	29 (18)	-- --
Kleskun Lake	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Valleyview ^b	-- --	172 (425)	-- --	-- --	373 (920)	257 (635)	-- --	608 (1 500)	11 (7)	4 --
Wanham	-- --	-- --	-- --	-- --	184 (454)	86 (212)	-- --	-- --	-- --	12 --
Total Grande Prairie	-- --	2 458 (6 070)	1 978 (4 883)	350 (863)	2 198 (5 425)	2 010 (4 963)	-- --	4 051 (10 000)	40 (25)	27
Fort Vermilion ^b	-- --	449 (1 109)	449 (1 109)	449 (1 109)	1 942 (4 795)	1 108 (2 735)	-- --	608 (1 500)	48 (30)	5 --
High Prairie ^b	-- --	507 (1 252)	507 (1 252)	1 048 (2 587)	2 132 (5 263)	2 132 (5 263)	-- --	-- --	16 (10)	4 --
Manning ^b	-- --	505 (1 247)	505 (1 247)	505 (1 247)	1 816 (4 483)	1 816 (4 483)	-- --	-- --	-- --	6 --
Three Creeks ^b	14 (35)	1 523 (3 760)	1 523 (3 760)	1 523 (3 760)	1 324 (3 270)	2 225 (5 493)	-- --	-- --	53 (33)	13 --
Whitemud	-- --	403 (995)	403 (995)	403 (995)	434 (1 072)	434 (1 072)	-- --	446 (1 100)	10 (6)	-- --
Total Peace River	14 (35)	3 387 (8 363)	3 387 (8 363)	3 928 (9 698)	7 648 (18 883)	7 715 (19 046)	-- --	1 054 (2 600)	127 (79)	28 --

Grazing Reserve	Area Developed or Improved hectares (acres)								Kilo- metres (miles) Fenced	Number of Dugouts
	Cleared and Piled	Burned ^a	Replied ^a	Broken	Worked Down	Seeded	Aerial Sprayed	Fertilized		
Black Bear	-- --	-- --	-- --	-- --	241 (596)	-- --	401 (990)	-- --	5 (3)	-- --
Connor Creek	-- --	302 (745)	302 (745)	354 (875)	506 (1 250)	-- --	1 689 (4 170)	-- --	18 (11)	4 --
Thorhild	-- --	-- --	-- --	213 (525)	-- --	-- --	354 (875)	-- --	-- --	4 --
Total Edmonton	-- --	302 (745)	302 (745)	567 (1 400)	747 (1 846)	-- --	2 444 (6 035)	-- --	23 (14)	8 --
Buck Mountain	-- --	-- --	-- --	-- --	-- --	-- --	340 (840)	-- --	-- --	-- --
Jack Pine	-- --	-- --	-- --	-- --	-- --	-- --	409 (1 010)	-- --	11 (7)	-- --
Medicine Lake ^b	-- --	992 (2 450)	1 073 (2 650)	1 812 (4 475)	689 (1 700)	689 (1 700)	460 (1 135)	-- --	-- --	10 --
Pembina ^b	724 (1 788)	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Rocky Mtn. House ^b	486 (1 200)	952 (2 350)	956 (2 361)	1 073 (2 650)	-- --	-- --	-- --	-- --	-- --	-- --
Sang Lake ^b	395 (975)	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Total West-Central	1 605 (3 963)	1 944 (4 800)	2 029 (5 011)	2 885 (7 125)	689 (1 700)	689 (1 700)	1 209 (2 985)	-- --	11 (7)	10 --

Grazing Reserve	Area Developed or Improved hectares (acres)								Kilo- metres (miles) Fenced	Number of Dugouts
	Cleared and Piled	Burned ^a	Replied ^a	Broken	Worked Down	Seeded	Aerial Sprayed	Fertilized		
Minburn	-- --	-- --	-- --	-- --	-- --	-- --	2 025 (5 000)	810 (2 000)	-- --	-- --
Rannach	-- --	153 (379)	153 (379)	263 (650)	110 (271)	110 (271)	-- --	810 (2 000)	-- --	7 --
St. Paul	-- --	-- --	-- --	657 (1 622)	657 (1 622)	657 (1 622)	-- --	-- --	-- --	-- --
Smoky Lake	-- --	-- --	-- --	193 (477)	193 (477)	193 (477)	-- --	-- --	-- --	2 --
Wolf Lake ^b	-- --	441 (1 090)	441 (1 090)	441 (1 090)	587 (1 450)	587 (1 450)	-- --	1 215 (3 000)	30 (19)	10 --
Total St. Paul	-- --	594 (1 469)	594 (1 469)	1 554 (3 839)	1 547 (3 820)	1 547 (3 820)	2 025 (5 000)	2 835 (7 000)	30 (19)	19 --
Hays	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	14 (9)	-- --
Lonesome Lake	-- --	-- --	-- --	-- --	-- --	-- --	-- --	527 (1 300)	-- --	-- --
Purple Springs	-- --	-- --	-- --	-- --	-- --	-- --	-- --	488 (1 206)	-- --	-- --
Twin River	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Total Lethbridge	-- --	-- --	-- --	-- --	-- --	-- --	-- --	1 015 (2 506)	14 (9)	-- --

	Area Developed or Improved hectares (acres)								Kilo- metres (miles) Fenced	Number of Dugouts
	Cleared and Piled	Burned ^a	Repiled ^a	Broken	Worked Down	Seeded	Aerial Sprayed	Fertilized		
Grazing Reserve										
Bow Island	--	--	--	--	--	--	--	425 (1 050)	--	5
Pinhorn	--	--	--	--	--	--	--	--	--	--
Sage Creek	--	--	--	--	--	--	--	--	--	3
Seven Persons	--	--	--	--	--	--	--	237 (585)	--	--
Total Medicine Hat	--	--	--	--	--	--	--	662 (1 635)	--	11
Provincial Total	1 619 (3 998)	8 685 (21 447)	8 290 (20 471)	9 284 (22 925)	12 829 (31 674)	11 961 (29 529)	5 678 (14 020)	9 617 (23 741)	245 (153)	103

SOURCE: Public Lands Division

^a Areas shown represent the areas previously cleared. The material from that clearing is burned and repiled.

^b Heritage Savings and Trust Fund Projects.

Table 36

Grazing Reserve Development and Improvement Costs

Thousands of Dollars

	1981/82		1980/81	
	Regular Funding	Heritage Savings and Trust Funding	Regular Funding	Heritage Savings and Trust Funding
Northern reserves	314.9	3 599.1	286.1	3 466.7
West-central reserves	368.2	853.2	179.2	364.0
East-central reserves	385.4	524.9	379.7	458.8
Southern reserves	413.1	n/a	455.6	n/a
Total Cost	1 481.6	4 977.2	1 300.6	4 289.6

SOURCE: Public Lands Division

NOTE: Improvement costs include land development, improvements, fertilization, and aerial spraying.

Table 37

Fish and Wildlife Prosecutions

Fiscal Comparisons

	Fiscal Year		
	1979/80	1980/81	1981/82
Convicted	3 556	3 886	3 489
Withdrawn	183	206	174
Dismissed	77	65	24
Pending	234	260	Not Available
Being Processed	--	--	560*
Total Prosecutions	4 050	4 417	4 247

*as of June 1, 1982

SOURCE: Fish and Wildlife Division

Table 38

Breakdown of Convictions by Legislation 1981/82

1981/82

Act/Regulation	Total Convictions	Fine Revenue \$	Average Fine \$
Alberta Fisheries Regulations	1 039	46 723	44.97
Wildlife Act	951	99 640	104.77
Liquor Control Act	678	45 485	67.09
Off Highway Vehicle Act	171	3 710	21.70
Small Vessel Regulations	169	6 810	40.30
Game Hunting Regulations	153	11 300	73.86
Migratory Bird Conv. Act/Regs.	59	3 255	55.17
Provincial Parks Act	46	1 920	41.73
Litter Act	39	2 200	56.41
Criminal Code	35	2 595	74.14
Highway Traffic Act	34	1 060	31.18
Motor Vehicle Admin. Act	23	2 495	108.48
Summary Conviction Act	19	2 200	115.79
Petty Trespass Act	13	460	35.39
Other	12	960	96.67
Total	3 441	231 013	67.14

SOURCE: Fish and Wildlife Division

Table 39

Fish and Wildlife Prosecutions

1981/82

Region	Wildlife	Migratory Birds	Fisheries	Other	Total
Southern	166	3	148	145	462
Central	373	23	425	524	1 345
Eastern Slope	237	0	269	282	788
Peace River	110	11	58	100	279
Northeast	281	14	203	248	746
Other Agency	40	15	12	0	67
Total	1 207	66	1 115	1 299	3 687*

* This figure does not include 560 prosecutions awaiting conversion as of June 1, 1982.

SOURCE: Fish and Wildlife Division

Table 40

**Breakdown of Fine
by Type of Conviction**

1981/82

Type	Total Convictions	Average Fine \$
Big Game	272	205.26
Upland Bird	134	66.27
Migratory	59	55.17
Miscellaneous Wildlife	700	66.13
Fisheries	1 044	45.35
Other	1 232	56.34
Total	3 441	67.14

SOURCE: Fish and Wildlife Division

Table 41

Problem Wildlife Activities

1981/82

	Southern Region	Central Region		Eastern Slopes Region		Peace River Region	Northeast Region		Total
		Calgary	Red Deer	Rocky Mountain House	Edson		St. Paul	Edmonton	
Beaver									
Complaints	156	242	610	160	292	429	340	810	3 039
Beaver Taken	122	226	1 301	89	202	204	720	1 485	4 349
Dams Blown	257	109	714	121	502	536	210	1 267	3 716
Wolf									
Complaints	2	12	4	11	21	73	12	27	162
Wolves Taken	—	—	—	—	14	4	—	4	22
Bear									
Complaints	37	84	55	193	206	381	256	138	1 350
Bears Taken	3	5	3	22	42	109	52	12	248
Ungulates									
Complaints	108	75	49	23	30	100	14	123	522
Animals Removed	—	3	—	2	—	1	2	6	14

SOURCE: Fish and Wildlife Division

Table 42

Species of Fish Stocked

1981/82

Species	Number	Percentage
Rainbow trout	3 596 058	85.9
Cutthroat trout	58 670	1.4
Eastern brook trout	125 946	3.0
Brown trout	4 560	0.1
Lake trout	238 306	5.7
Yellow perch	151 000	3.6
Northern pike	457	0.1
Small mouth bass	9 600	0.2
Total	4 184 591	100.0

SOURCE: Fish and Wildlife Division

Table 43

Distribution of Stocked Fish

1981/82

Region	Fish stocked	Number of sites
Southern	1 342 808	33
Central	364 546	44
Eastern Slopes	1 156 543	94
Northeast	873 726	45
Peace River	446 968	18
Total	4 184 591	234

SOURCE: Fish and Wildlife Division

Table 44

Commercial Fish Production in Alberta

Year	Weight		Value to Fishermen	Value as Marketed
	Tonnes	Tons	\$	\$
1979/80	2 015	2 221	1 728 760	2 818 857
1980/81	2 486	2 740	1 850 440	3 326 324
1981/82	2 128	2 345	1 565 544	3 172 156

SOURCE: Fish and Wildlife Division

Table 45

Buck for Wildlife - Fisheries Projects

1981/82

Region	Project	Status	1981/82 Budget \$	Development Activity
Southern	Little Beaverdam Lake Lake McQuillan Reservoir	maintenance planning	2 590 6 200	Site development Water fees
Central	Coronation Pond Silver Creek Bow River Kerbes Pond Mirror Reservoir Anderson's Dam	maintenance maintenance planning construction maintenance construction	15 380 3 800 1 300 2 430 6 870 21 920	Erosion protection Wire repairs Consultant Fence construction Erosion protection Repair spillway
Eastern Slopes	Carson Lake North Raven River Prairie Creek Bathing Lake Raven River Crooked Creek	maintenance continuing continuing planning continuing continuing	150 24 720 26 580 1 720 64 200 7 600	Fence repairs Fence repairs Fence construction Fence construction
Northeast	Boyle Pond	construction	67 590	Reservoir development
Peace River	Christina Lake Figure Eight Lake	construction construction	43 960 3 110	Lake stabilization Lake stabilization
Administration	Contracts, manpower, misc. supplies		114 000	

SOURCE: Fish and Wildlife Division

Table 46

Buck for Wildlife - Wildlife Projects

1981/82

Region	Project	Status	1981/82 Budget \$	Development Activity
Southern	Lake Newell Mountain Bluebird Trails	continuing new	63 370 800	Island protection Construct and install nest boxes
Central	Buffalo Lake Namaka Lake Red Deer Habitat Retention Slack Slough	continuing continuing continuing continuing	1 960 2 790 26 220 10 600	Implement management recommendations Develop and improve acquired lands Payment of tax incentive contracts Develop bait station and observation points
Eastern Slopes	Athabasca Ranch Chip Lake Shiningbank	continuing continuing planning	11 350 400 100	Exclosure construction and evaluate range Fencing shoreline Feasibility studies
Northeast	Beaverhill Lake Lychak Therien Lake	continuing continuing new	4 010 5 510 1 500	Fencing, seeding and fertilizing Fence construction Spread gravel on nesting island
Peace River	Birch Hills	continuing	800	Evaluation of browse plots
Provincial	Cliff nesting Goose bale program Project Evaluations Shelterbelt maintenance	continuing continuing continuing continuing	680 7 060 14 390 530	Construct cliff nesting sites Provide goose nesting sites Evaluation of various projects Weed control and tree replacement
Administration	General Services		105 920	

SOURCE: Fish and Wildlife Division

Table 47

Wildlife Certificate and Game Licence Sales

	Fiscal Year		1981/82 Fee \$	1981/82 Total \$
	1980/81	1981/82		
Resource development	166 191	164 527	5	822 635
Wildlife certificate	166 191	164 527	5	822 635
Bird game licences				
Resident	105 925	94 398	5	471 990
Non-resident	3 773	3 262	25	81 550
Non-resident alien	1 245	1 154	50	57 700
Big game licences (resident)				
Antelope (trophy)	1 570	1 879	20	37 580
Antelope (non-trophy)	922	25	10	250
Bear (black)	15 915	13 726	10	137 260
Bear (grizzly)	996	894	20	17 880
Cougar	318	154	20	3 080
Deer (antlerless mule)	---	---	---	---
Deer (male mule)	---	---	---	---
Deer (general mule)	---	---	---	---
Deer (antlerless white-tailed)	54 528	58 726	10	587 260
Deer (male white-tailed)	---	---	---	---
Deer (general white-tailed)	---	---	---	---
Deer (Camp Wainwright)	66 625	74 603	20	1 492 060
Elk (antlerless)	699	770	20	15 400
Elk (male)	---	---	---	---
Elk (general)	---	---	---	---
Elk (Cypress Hills)	28 894	31 831	10	318 310
Goat	423	443	20	8 860
Moose (general)	42	45	20	900
Sheep (non-trophy)	62 096	65 106	10	651 060
Sheep (trophy)	436	494	10	4 940
	2 480	2 676	20	53 520
Total	235 998	251 372		3 328 360
Resident authorizations				
Moose (male)	4 134	4 260	---	---
Moose (antlerless)	2 170	2 285	---	---
Elk (male)	1 039	2 100	---	---
Elk (antlerless)	2 163	3 340	---	---
Deer (male white-tailed)	377	350	---	---
Deer (antlerless white-tailed)	10 949	4 260	---	---
Deer (male mule)	870	1 175	---	---
Deer (antlerless mule)	2 446	3 125	---	---
Total	24 148	20 895	---	---

	Fiscal Year		1981/82 Fee \$	1981/82 Total \$
	1980/81	1981/82		
Big game licences (non-resident)				
Antelope (non-resident trophy)	18	25	125	3 125
Bear (black)	46	51	50	2 550
Bear (grizzly)	3	4	125	500
Guide authorization	190	258	25	6 450
Cougar	—	2	100	200
Deer (male mule) (general)	138	149	100	14 900
Moose (male) (general)	180	198	100	19 800
Sheep (trophy)	2	7	125	875
Wolf	1	2	75	150
Deer (male white-tailed) (general)	115	126	75	9 450
Elk (male) (general)	128	160	100	16 000
Total	821	982		74 000
Big game licences (non-resident alien)				
Bear (black)	412	431	100	43 100
Bear (grizzly)	32	23	250	5 750
Cougar	3	7	200	1 400
Deer (male mule) (general)	144	185	150	27 750
Deer (male white-tailed) (general)	83	140	150	21 000
Elk (male) (general)	182	237	200	47 400
Moose (male) (general)	715	718	200	143 600
Moose (zone one male)	644	579	100	57 900
Sheep (trophy)	82	81	250	20 250
Wolf	24	28	150	4 200
Total	2 323	2 429		372 350

SOURCE: Fish and Wildlife Division

Table 48

Angling and Fishing Licence Sales

	Fiscal Year		1981/82 Fee \$	1981/82 Total \$
	1980/81	1981/82		
Resource development	308 444	329 427	2	658 854
Resident angling	303 356	323 775	3	971 325
Non-resident (limited)	3 163	3 158	3	9 474
Non-resident (seasonal)	1 925	2 494	10	24 940
Spear fishing	654	1 136	3	3 408
Sturgeon angling	280	413	5	2 065
Domestic Indian/Metis	—	163	no charge	—
Fish marketing (Class A)	1	1	100	100
Fish marketing (Class B,C,D)	B,C,D 10	B,C,D 8	10	80
Zone commercial	742	700	50	35 000
Zone fisherman	1 638	1 430	15	21 450
Zone recreational	152	169	5	845
Commercial game fish farm (initial)	6	12	50	600
Commercial game fish farm (renewal)	40	40	15	600
Private game fish farm (initial)	465	673	10	6 730
Private game fish farm (renewal)	950	980	5	4 900
Restricted game fish farm	18	21	5	105
Bait fishing	40	45	25	1 125
Total	622 626	670 131		1 746 601

SOURCE: Fish and Wildlife Division

Table 49

Alberta Fur Production (Wild Fur)

1981/82

	Number of Pelts	Mean Price \$	Value \$
Badger	979	31.00	30 349.00
Black bear	240	44.80	10 752.00
Beaver	60 616	20.98	1 271 723.68
Bobcat	30	168.21	5 046.30
Coyote	31 652	69.59	2 202 662.68
Ermine/weasel	10 033	1.34	13 444.22
Fisher	4 280	135.75	581 010.00
Fox (cross)	1 159	87.83	101 794.97
Fox (red)	3 019	58.16	175 585.04
Fox (silver)	222	67.82	15 056.04
Fox (white)	53	36.70	1 945.10
Lynx	13 659	284.61	3 887 487.99
Marten	8 941	36.71	328 224.11
Mink	11 724	31.80	372 823.20
Muskrat	172 260	3.19	549 509.40
Otter	265	41.60	11 024.00
Raccoon	47	31.69	1 489.43
Skunk	107	6.32	676.24
Squirrel	103 705	1.52	157 631.60
Wolf	462	88.25	40 771.50
Wolverine	80	184.79	14 783.20
Total			9 773 789.70

SOURCE: Fish and Wildlife Division

Department Revenues and Expenditures

Alberta Energy and Natural Resources Statement of Revenue

for the year ended March 31, 1982
(with comparative figures for the year ended March 31, 1981)
(Thousands of Dollars)

ENERGY	<u>1981/82</u>	<u>1980/81</u>
Royalties		
Crude Oil	\$ 2 179 817	\$ 1 970 143
Natural Gas and Products	1 956 294	1 903 045
Coal	11 920	8 263
Oil Sands	229 714	224 921
Quarrying, Mining and Other	2 628	525
	<u>4 380 373</u>	<u>4 106 897</u>
Rentals & Fees		
Petroleum and Natural Gas	91 007	84 234
Oil Sands	4 836	4 469
Coal	4 408	4 249
	<u>100 251</u>	<u>92 952</u>
Sale of Crown Rights	<u>556 914</u>	<u>758 839</u>
Mineral Tax	<u>134 830</u>	<u>145 796</u>
Gross Revenue (Energy)	<u>5 172 368</u>	<u>5 104 484</u>
Less Incentive Credits		
Exploratory Drilling Incentive Credits	(139 659)	(143 415)
Geophysical Incentive Credits	(16 545)	(5 061)
	<u>(156 204)</u>	<u>(148 476)</u>
Net Revenue (Energy)	<u>5 016 164</u>	<u>4 956 008</u>
 RENEWABLE		
Taxes, Licences and Fees		
Fish and Wildlife Royalty and Taxes	226	238
Fishing Licences	1 615	1 520
Game Licences	4 422	3 601
Landman Licencing Fees	39	15
Forest Technology School Fees	293	226
Timber Dues and Fees	9 391	7 655
	<u>15 986</u>	<u>13 255</u>
Leases and Permits		
Cultivation Leases	755	426
Grazing Leases and Hay Permits	3 341	2 902
Public Land Leases and Permits	2 014	1 010
Right of Entry	3 394	2 601
Sand and Gravel	1 222	1 973
	<u>10 726</u>	<u>8 912</u>

Provincial/Federal Government Agreements	4	2 466
From Revenue Producing Assets	529	913
Sales of Assets		
Homestead Sales	1 044	434
Land Sales	11 501	4 664
	12 545	5 098
Miscellaneous Revenue		
Survey Maps Plans, Aerial Photography	430	604
Other	1 810	979
	2 240	1 583
Total Revenue (Renewable)	42 030	32 227
Departmental Total Revenue	\$5 058 194	\$4 988 235

Alberta Energy and Natural Resources Statement of Expenditures

for the year ended March 31, 1982
(with comparative figures for the year ended March 31, 1981)
(Thousands of Dollars)

	<u>1981/82</u>	<u>1980/81</u>
Departmental Support Services — Program 1		
1 Central Support	\$ 1 243	\$ 900
2 Administrative Services	9 324	6 467
3 Policy Analysis and Planning	3 767	2 507
4 Advisory Services and Research	11 053	7 839
	25 387	17 713
Resource Evaluation and Planning — Program 2		
1 Program Support	455	259
2 Resource Evaluation	9 548	5 975
3 Resource Planning	777	606
	10 780	6 840
Minerals Management — Program 3		
1 Mineral Resources	17 233	6 554
2 Mineral Revenue	4 262	3 129
	21 495	9 683
Forest Resource Management — Program 4		
1 Program Support	25 636	20 227
2 Forest Land Use	5 066	3 522
3 Reforestation and Reclamation	6 643	5 074
4 Timber Management	9 245	2 927
5 Forest Protection	76 124	45 170
6 Forest Research	758	917
	123 472	77 837
Public Lands Management — Program 5		
1 Program Support	4 212	3 124
2 Land Dispositions	1 905	1 570
3 Land Management	7 108	5 280
	13 225	9 974
Fish and Wildlife Division — Program 6		
1 Program Support	4 897	4 576
2 Wildlife Service	4 348	4 157
3 Fisheries	2 270	2 739
4 Public Service and Enforcement	5 822	4 562
5 Conservation Education	899	648
6 Habitat Protection and Management	2 175	---
	20 411	16 682

Alberta Oil Sands Equity – Program 7	943	421
Foreign Ownership of Land Administration – Program 8	231	161
Surveying and Mapping Services – Program 11	6 061	4 931
Alberta Petroleum Incentives Program – Program 12	1 705	—
Gross Expenditures	223 710	144 242
Less Expenditure Recoveries		
Alberta Petroleum Incentive Program	1 705	—
Other	1 579	977
	3 284	977
Net Expenditures	<u>\$220 426</u>	<u>\$143 265</u>

NOTE: Alberta Oil Sands Technology and Research Authority and Alberta Petroleum Marketing Commission are not included in the above.

Prepared by Financial Accounting Branch
August 19, 1982

